30 Apr 19

Mira topics
STC
Human and Financial resources

Redline
Switch

Tyler @ Provincial - 3724
Friction -

Fedex P1
HFPU.
1950 sergeant ave
R3H 1C8
1638076 45

Heat Shrink
1" 164' Master Spool #175 20 X No Stock.

Pico 8325-27 Black.

25 @ 4' #106 LORDCO

EC130 Assy

AS350 Assy

1- Heat Shrink:

- Brand Alpha Wire, Model FIT-221-1. 1"wide, **BLACK** color
- Purchased in 1 meter length.
- Material : Polyolefin. A family of thermoplastics based upon the unsaturated hydrocarbons known as olefins. When combined with butylene or styrene polymers, they form compounds such as polyethylene and polypropylene.

2- Install Shrink:

- Cut Shrink in **6.25"** lengths. Insert into U clips.
- Set U clips on their side on aluminum sheet.
- Heat oven to 350F for 30 min.

tel: 1-418-561-4512, fax: 1-418-836-2291, 860 Marie-Victorin, Saint-Nicolas, Levis, Quebec, Canada G7A 3S9.
www.helitowcart.com info@helitowcart.com

314-0016-05-C
BearPaw
Heat Shrink Installation

R44 on Assy

1- Install Shrink:

- Prepare Heat Shrink:

  BP44 & BP66:
  Use 1.5" wide shrink. Cut to 5.5" length.

  BP350 & BP130:
  Use 1.5" wide shrink. Cut to 6.75" length.

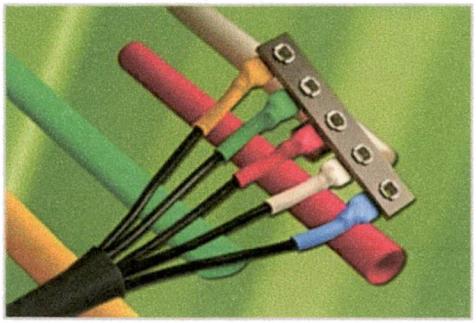
- Insert U clips into shrink.
- Set U clips standing or on their side on aluminum sheet on cookie pan.
- Heat in oven at 350F for approx. 5 minutes or until shrink is tightly resting against stainless steel on its whole surface.

Nature modifications: Complete update of instruction

t: 1-418-561-4512, 877A Alphonse-Desrochers, Saint-Nicolas, Levis, Quebec, Canada G7A 5K6
www.helitowcart.com info@helitowcart.com

Part #	Shrink Ratio	Material	Min Supplied ID	Max Recovered ID	Nom Recovered Wall	Temperature	Ratings
FIT-221-1IN	2:1	XLPO	1	0.5	0.035	-55 to 135	AMS DTL-23053/5 CL 1 Colors, AMS DTL-23053/5 CL 2 Clear, CA Prop 65, CSA 198, UL 224

PART NO. FIT-221-1IN



This picture is representative only and may not match the specific configuration of the product listed on this page. Please refer to the product specifications for more information on this part number and its exact configuration.

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Construction

1) Tubing Type	Heat Shrinkable Tubing
2) Tubing Material	Cross Linked Polyolefin
3) Minimum Supplied ID(In)	1.000
4) Maximum Recovered ID (In)	0.500
5) Nominal Recovered Wall Thickness(In)	0.035
6) Color(s)	BLACK, WHITE, CLEAR, RED, YELLOW, BLUE, GREEN,ORANGE

Applicable Specifications

1) UL	Standard 224 (Except Clear) 600V
2) CSA International	Standard 198 (Except Clear) 600V
3) Other	AMS-DTL-23053/5 Class 1 (Except Clear) AMS-DTL-23053/5 Class 2 (Clear Only)

Environmental

1) EU Directive 2011/65/EU(RoHS2):	All materials used in the manufacture of this part are in compliance with European Directive 2011/65/EU regarding the restriction of use of certain hazardous substances in electrical and electronic equipment. Consult Alpha Wire's web site for RoHS C of C.
2) REACH Regulation (EC 1907/2006):	This product does not contain Substances of Very High Concern (SVHC) listed on the European Union's REACH candidate list in excess of 0.1% mass of the item. For up-to-date information, please see Alpha's REACH SVHC Declaration.
3) California Proposition 65:	The outer surface materials used in the manufacture of this part meet the requirements of California Proposition 65.

Properties

	Physical & Mechanical Properties	
1) Temperature Range	-55 to 135°C	
2) Shrink Ratio	Approximately 2:1	
3) Full Recovery Temperature	121°C	
4) Minimum Shrink Temperature	90°C	
5) Tensile Strength	1500psi, Min	ASTM D638
6) Elongation	200%, Min	ASTM D638
7) Low Temperature Flex(-55°C)	no cracking	AMS-DTL-23053

8) Heat Shock(250°C,4hrs)	no cracking	AMS-DTL-23053
9) Secant Modulus	$2.5x10^{4}$ psi, Min	ASTM D882
10) Longitudinal Change	+/-5%	AMS-DTL-23053
11) Specific Gravity(Colors)	1.35, Max	ASTM D792
Specific Gravity(Clear)	1.00, Max	
12) Shelf Life	5 Years @ 18 to 35°C	
	Electrical Properties	
1) Dielectric Strength	500 V/mil, Min	ASTM D876
2) Volume Resistivity	$1x10^{14}$ ohm-cm, Min	ASTM D876
	Chemical Properties	
1) Water Absorption	0.50%, Max	ASTM D570
2) Corrosion(0°C,16hrs)	no corrosion	AMS-DTL-23053
3) Fluid Resistance(23°C,24 Hrs)	1000 PSI, Min	AMS-DTL-23053
4) Fungus Resistance	Pass	AMS-DTL-23053
5) Vacuum Outgassing - CVCM	0.10%, Max	ASTM E595
6) Halogen Free	No	
7) Lead Free	Yes	

Other

Packaging

1) 250X4 FT	FIT 4X4:	4 x 4 x 49 Continuous length
2) 250 FT	CR19-1.8:	19.75 x 1.75 x 8 Max. 3 pieces/Min length 50 FT.
3) 50 FT	CR6.5-4:	6.5 x 4 x 3.25 Continuous length
4) 5X4 FT	FIT 2X2:	2 x 2 x 49 Continuous length
5) 16 FT	CR10-2:	10 x 2 x 6 Continuous length
6) 100X1 IN	PLASTIC BAG	Continuous length
7) 8X6 IN	PLASTIC BAG	Continuous length

Notes

1) Orange available for 1/2 - 150 ft, 3/4 - 250 ft, 1IN - 250 ft, 11/2IN - 125Ft and 2IN - 125 ft sizes.

Our FIT heat-shrink tubing offers a reliable way to protect and seal terminations or add additional mechanical ruggedness. FIT preferred heatshrink products are made from premium compounds under the tightest manufacturing controls. This means FIT will consistently have excellent physical characteristics such as low longitudinal shrinkage and wide temperature ranges while providing an elegant appearance when used alone or on OEM equipment.

Request a Sample Download Brochure

Consult a Cable Expert

Need a more unique construction? Different color code? Different color Jacket?

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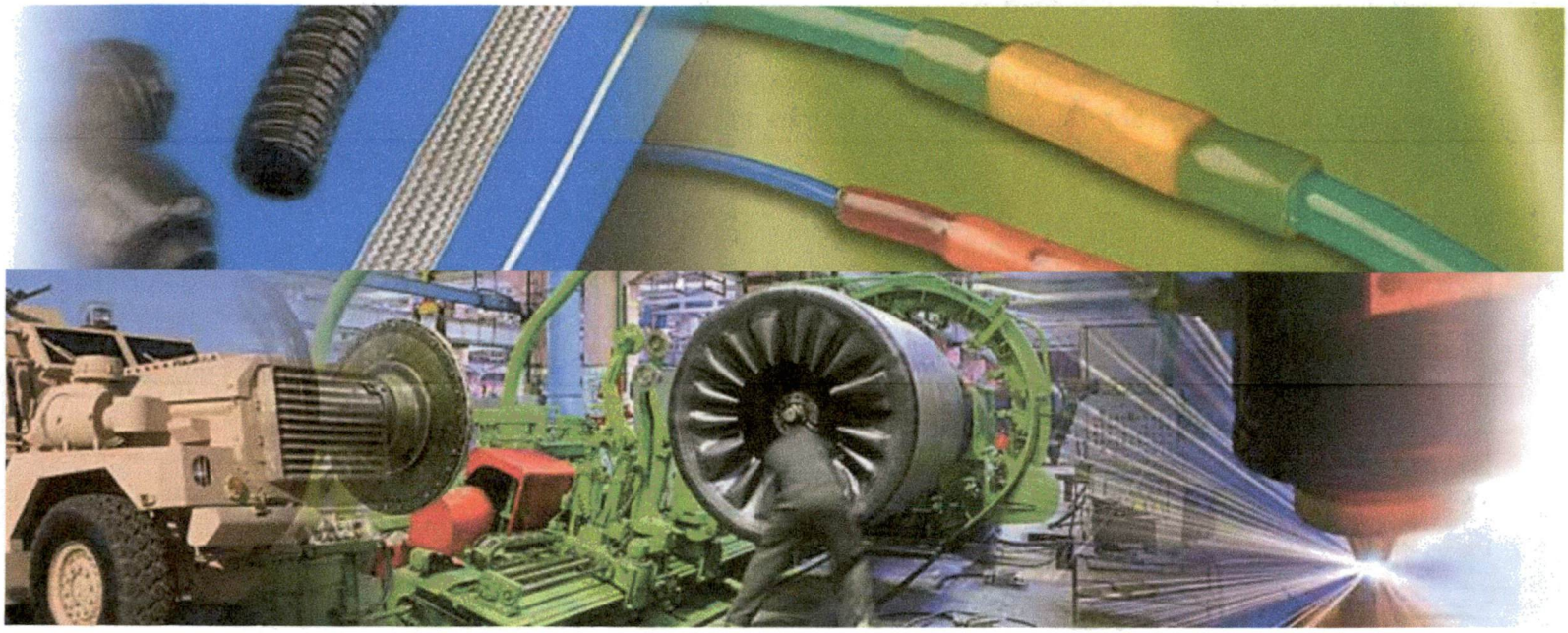
The Perfect FIT® for Any Need

FIT Heat-Shrink Tubing
FIT Wire Management



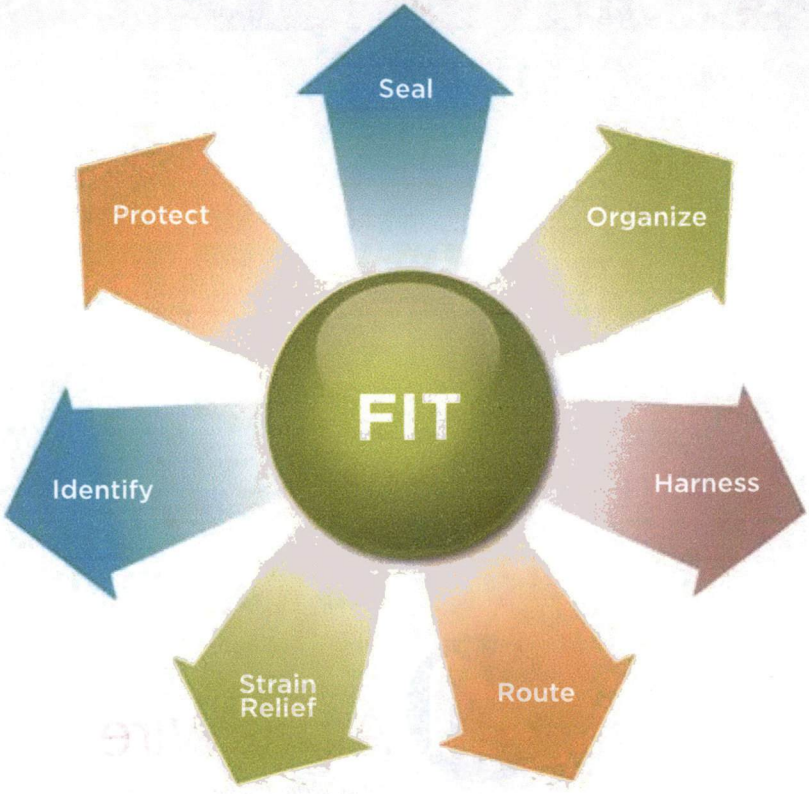
AlphaWire

Cables you trust. Service you deserve.

The Right FIT for Your Applications

FIT heat-shrink tubing and wire management products give you more choices to achieve reliable, rugged cabling systems. Within our wide array of products, you'll find solutions to satisfy any application, from general-purpose needs to extremes of temperature, chemicals, and abrasion.

Heat-Shrink Tubing	Standard Polyolefin Tubing
	Dual-Wall Polyolefin Tubing
	Special-Purpose Tubing
Wire Management	Non-Shrink Tubing
	Woven Sleeving
	Specialty Sleeving
	Adhesive Tape
	Lacing Tape
	Copper Braid and Tape



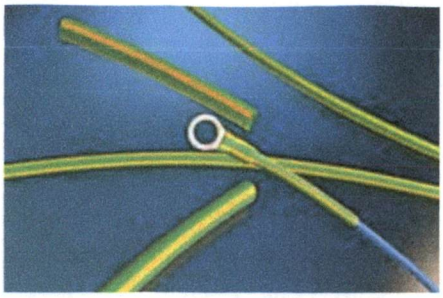
FIT® Heat-Shrink Tubing

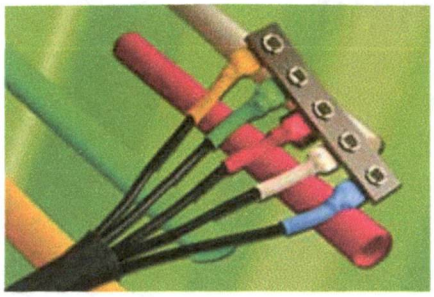
FIT heat-shrink tubing offers a reliable way to protect and seal terminations, while adding additional mechanical ruggedness.

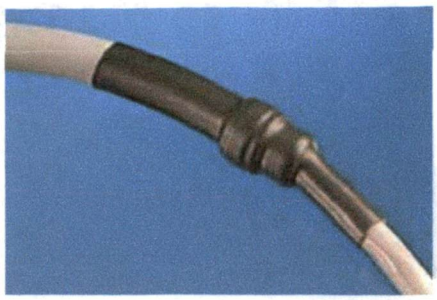
The Alpha Wire FIT line consists of a wide range of general-purpose and special-purpose styles, materials, and tubing types, each having unique attributes that provide solutions for use in the broadest possible range of applications and environments.

Made from premium compounds under the tightest manufacturing controls, FIT will consistently have excellent physical characteristics.

- **2:1 to 6:1 shrink ratios**
- **Irradiated or crosslinked materials**
- **Low longitudinal shrinkage**
- **Wide temperature range**
- **Chemical and solvent resistant**
- **Choice of standard and custom colors**
- **Unlined and adhesive lined**
- **Low outgassing: FIT-221L meets NASA's requirements for low-outgassing materials**







Heat-Shrink Tubing

Material	Purpose	UL VW-1	Resistance			Flexibility	Operating Temperature	Shrink Ratio	FIT Family
			Chemical	Heat	Abrasion				
Single-Wall Irradiated Polyolefin for General-Purpose Use									
Thin-wall irradiated polyolefin	LSZH: reduced smoke generation and gas emission Low outgassing	✔		✔		✔	-55 to +105°C	2:1	**FIT-221L**
Irradiated polyolefin	Variety of shrink-ratios						-55 to +135°C	2:1	**FIT-221**
		✔		✔			-55 to +135°C	4:1	**FIT-421**
Flame-retardant irradiated polyolefin	Low shrink temp	✔		✔			-55 to +135°C	2:1	**FIT-221V**
							-55 to +135°C	3:1	**FIT-321V**
Irradiated polyolefin	600V ground lead identification	✔		✔			-55 to +135°C	2:1	**FIT-260**
Semi-rigid irradiated polyolefin	30% stronger 25% stiffer than standard polyolefin	✔	✔		✔		-55 to +135°C	2:1	**FIT-295**
Dual-Wall Polyolefin for Additional Sealing									
Surface irradiated, dual extruded	Meltable inner wall, no adhesive		✔		✔		-55 to +125°C	2.5:1	**FIT-300**
Bonding, thermoplastic adhesive lined	Bonds to most materials; high voltage (2kV at 90°C continuous)		✔	✔	✔		-55 to +110°C	3:1	**FIT-700**
Bonding, adhesive lined	Water and corrosion protection		✔	✔	✔		-55 to +125°C	3:1	**FIT-321**
							-55 to +90°C	5.6:1	**FIT-621**
							-55 to +125°C	2:1	**FIT-750**
Special-Application Tubing									
Irradiated PVC	Low shrink temp; 30% stronger than standard polyolefin	✔					-20 to +105°C	2:1	**FIT-105**
Irradiated PVDF	High shrink temp; 3x tensile strength of standard polyolefin	✔	✔	✔	✔		-55 to +150°C	2:1	**FIT-350**
FEP	High shrink temp; thin wall thickness		✔				-75 to +200°C	1.2:1	**FIT-400**
PTFE	High shrink temp; thin wall thickness		✔				-75 to +260°C	1.5:1	**FIT-500**
Chlorinated polyolefin	Oil resistant	✔		✔	✔		-75 to +121°C	2:1	**FIT-600**
Flexible fluoroelastomer	High shrink temp		✔			✔	-40 to +200°C	2:1	**FIT-650**
Polyethylene/ polyester	Resists harsh environments				✔	✔	-40 to +125°C	2:1	**FIT-FABRIC**
Irradiated silicone rubber	Pliable	✔		✔	✔	✔	-50 to +200°C	1.7:1	**FIT-FLEX**
Irradiated PVDF	Transparent after shrink; 2x tensile strength of standard polyolefin	✔	✔	✔			-55 to 150°C	2:1	**FIT-CLEAR**

FIT Wire Management Solutions

General-Purpose Tubing

Our range of tubing includes traditional solid PVC tubing to convoluted slit loom tubing and spiral wrap. Our Zipper Tubing™ provides a professional finish to wiring installations by eliminating exposed wiring and providing added protection against flame, chemicals, and abrasion.

Flexible PTFE Tubing

To improve the reliability of cable harnesses, PTFE tubing provides a heat and abrasion resistant wire insulator under the most adverse conditions. With an unmatched temperature range, exceptional abrasion resistance, and excellent dielectric properties, it maintains flexibility over its entire temperature range. Alpha offers both standard-wall and space-saving thin-wall versions.

Fiberglass Sleeving

Our fiberglass sleeving is used to provide extra protection for cable in a tough external environment, fitting comfortably over wire and cable without needing to be shrunk to size first. Combining flexibility with excellent abrasion resistance and high-temperature performance, our fiber glass sleeving is available uncoated or coated with acrylic, PCV, or silicone to provide the best match to application requirements.

Woven Sleeving

Our expandable and nonexpendable woven sleeving gives you the range of performance you need for applications running from general purpose to extreme of abrasion, chemicals, and temperature. With eleven families, woven in different braid densities from materials ranging from PVC and nylon to PPS and PTFE, finding the right sleeving for your application is easy.

Lacing Tape

Alpha lacing tapes offer high tensile strength, flexibility, and knot retention, maintaining a wide contact area with the insulation so that it remains in place. Nylon has excellent tensile strength and resists acids, abrasion, flame, and fungus. Polyester has all the characteristics of nylon, but has better resistance to acids, and no appreciable discoloration.

- **0.012 to 0.014 in. (0.30 to 0.36 mm) thickness range**
- **High tensile strength**
- **Excellent knot retention**

EMI Shielding and Grounding

Our copper braid and tape, and brass braid, help achieve EMI protection or grounding.

Copper Braid

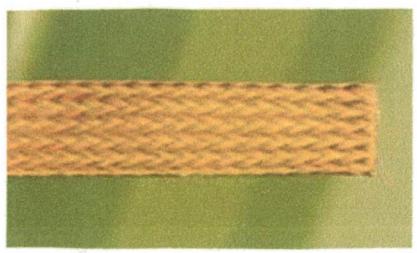
- **Flat, round, or oval configurations**
- **Tinned copper or silver-plated copper**
- **Allows 360° termination for low-resistance path to ground**

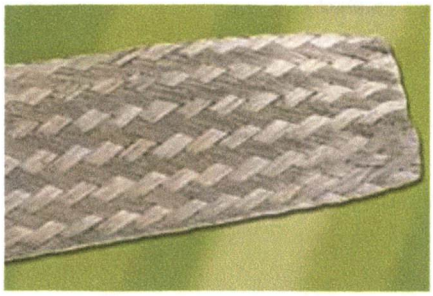
Copper Tape

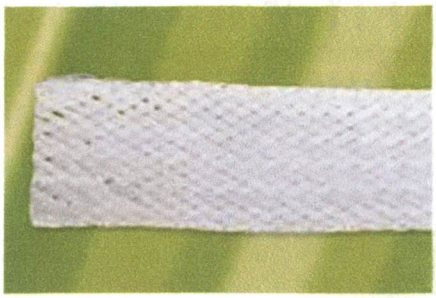
- **Highly conductive adhesive backing**
- **0.5 to 2.0 in. (12.70 to 50.8 mm) width**
- **Approx. 5 dB better than other metal foil shielding tapes**

Brass Braid

- **Natural antimicrobial and germicidal properties**
- **Attractive brass finish gives high-end look**
- **Four sizes from .125 to .5 inch diameter**







PTFE and Fiberglass Sleeving

FIT PTFE and Braided Fiberglass Sleeving			
Material	**Feature**	**Characteristics**	**FIT Family**
PTFE	Thin wall Standard wall	-75°C to +260°C Excellent heat and chemical resistance Flexible wire protection for harnesses and ground straps Resistance to heat, oil, and abrasion	**TFT-200** **TFT-250**
FIT Braided Fiberglass Sleeving			
Material	**Feature**	**Characteristics**	**FIT Family**
Acrylic coated	Chemical resistant	-30°C to +155°C	**AF-155**
PVC coated	General purpose	-20°C to +130°C High temperature, abrasion, and oil resistance Resists fraying, bending, and knotting	**PIF-130**
Silicone coated	Extreme abrasion resistance	-70°C to +200°C Highly flexible routing Extreme abrasion resistance Superior electrical properties	**PIF-200**
Uncoated	Extreme temperatures	-60°C to +648°C Extreme flexibility Extreme heat environments	**PIF-240**

Tubing

FIT General-Purpose Tubing			
Material	**Feature**	**Characteristics**	**FIT Family**
PVC	Multipurpose	-20°C to +105°C Flexible wire protection for harnesses and ground straps 37 sizes from 0.022" to 2.5"	**PVC-105**
PVC tubing Nylon connectors	Flexible, liquid tight	-18°C to +50°C Maximum flexibility Usable in extremely tight quarters	**FNT** **SLC/RLC**
PE, nylon, PTFE, PVC	Spiral wrap	Wide range of materials, temperature ranges, and mechanical properties	**SW**
PE tubing PP fittings	Convoluted slit loom	-40°C to +93°C Abrasion and fluid resistant Light weight Easy, flexible cable breakouts	**Type 492**
PVC	Zipper tubing	-20°C to +105°C Loc-Trac® zipperlike closure Protection against flame, chemicals, and abrasion	**ZIP-41**

FIT Wire Management Applications

Harnessing

Make any wire harness organized, manageable, and neat with our tubing, sleeving, spiral wrap tubing, zipper tubing, and lacing tape. Our unique ZIP-GRP expandable enclosure sleeving allows easy re-entry and unlimited wire and cable break outs with its hook and loop fastener system.

Routing

Get the advantages of conduit in a flexible non-metallic, liquid-tight tubing and connection system that protects wire, copper cable, and fiber-optic cable in factories, offices, or underground installations.

Use our watertight tubing to replace rigid raceways where flexibility, re-entry, or re-usability is required. Additionally, Alpha offers slit looms to provide a convenient solution for your routing needs.

Shielding

Add shielding easily and quickly. We offer flat, round, and oval braided shielding for additional protection against EMI and for grounding protection. Our copper foil shielding tape is backed with a highly conductive, pressure-sensitive adhesive for use in a wide variety of EMI/RFI shielding applications in cable and connector assemblies.

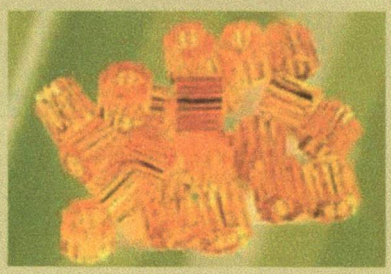
Protection

Our rugged FIT sleeving is available in a range of materials and construction to give outstanding performance in a range of extreme applications:

- **Wide temperature ranges**
- **UV exposure**
- **Heavy abrasion and cut-through potential**
- **Outgassing**

Our rugged FIT sleeving is available in both expandable and wrappable versions.

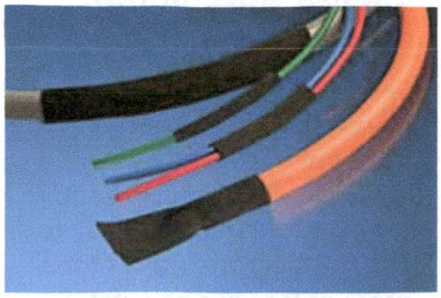
FIT Accessories

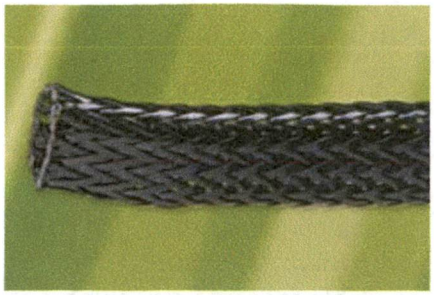


FIT-FILL Adhesive
For applications that require additional sealing of voids not accommodated by heat-shrink tubing, FIT-FILL adhesive is the answer. The bead-shaped, flame-retardant adhesive has a melting temperature of 90°C and an operating temperature from -40°C to +105°C, with no cracking with low-temperature flexing down to -40°C. It also offers good chemical and physical resistance.

Heat Guns
Alpha heat guns are the perfect complement to FIT tubing, making it easy to apply the tubing quickly and efficiently.

Wrappable Sleeving Tool
This tool simplifies applying our GRP-130 and GRP-130NF sleeves.





Woven Sleeving

FIT Expandable Woven Sleeving			
Material	**Feature**	**Characteristics**	**FIT Family**
Polyester	General purpose	-75°C to +125°C Good abrasion and cut-through resistance Flame resistant (110) and flame retardant (120) versions	**GRP-110** **GRP-120**
PET	Non-fraying	-75°C to +125°C Good abrasion and cut-through resistance Flame resistant (110) and flame retardant (120) versions	**GRP-110NF** **GRP-120NF**
PET	Wrappable	-70°C to +125°C Bends tightly without distorting or opening Easy to install NF = flame retardant	**GRP-130** **GRP-130NF**
Nylon polyamide	Advanced protection	-45°C to +150°C Extreme abrasion resistance without losing flexibility or durability Resists fuels, solvents, salt water, chemicals, and UV rays Expandable to 150%	**GRP-160**
PPS	Advanced chemical resistance	-70°C to +200°C Resists acids, bases, solvents, and fuels Extremely lightweight	**GRP-170**
Nylon	Maximum protection	-60°C to +150°C Superior abrasion resistance Smooth inner wall to prevent internal abrasion damage Resists fuels, solvents, salt water, chemicals, and UV rays	**GRP-180**
PTFE	Extreme protection	-70°C to +280°C Cut and abrasion resistant Resists virtually all chemicals and UV rays Thermally stable Low outgassing	**GRP-200**
PET	Wrappable with hook and loop closure	-75°C to +125°C Unlimited breakouts Abrasion and cut-through resistance Oil and solvent resistance	**ZIP-GRP**
FIT Non-Expandable Woven Sleeving			
Material	**Feature**	**Characteristics**	**FIT Family**
PET	Heavy duty	-70°C to +125°C	**XS-100HD**
Nylon	General purpose	-45°C to +120°C Tightly woven Excellent abrasion resistance and durability	**XS-200N**
Nylon	Maximum protection	-45°C to +120°C Excellent abrasion resistance Tightly woven Deflects high-pressure hose ruptures Resists fuels, chemicals, UV, rot, and vermin Smooth inner wall to prevent internal abrasion damage	**XS-300**

The cables you trust. The service you deserve.

Every application is critical and cable failure is not an option when the safety of your equipment and personnel is paramount. Specify Alpha Wire FIT wire management for extreme environments and crucial applications, since the integrity of your system is only as robust as the products you use.

Superior availability

Alpha offers FIT wire management products from stock in most sizes and constructions, in small quantities, so you can order them when you need them. Our products are available for same-day shipment, eliminating long lead times.

Service and support, second-to-none

Selecting the correct wire management products is essential to overall system reliability, performance, and safety. So we make it easy for you to select the right Alpha product for your specific application. Our online resources include a wire and cable selection guide, technical information, full product catalog, and a distributor locator to make it easy to select and get the cable or wire management product you need. Just visit **www.alphawire.com!**

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AlphaWire

Cables you trust. Service you deserve.

Lit. No. FWM-Ovr-Bro-1404
Supersedes: FWM-Ovr-Bro-1201

3M™ Heat Shrink Tubing FP-301

Flexible, Polyolefin

Data Sheet May 2017

Description	3M™ Heat Shrink Tubing 3M FP-301 offers an excellent balance of electrical, physical and chemical properties for a wide variety of industrial and military applications. Rated for 135°C continuous operation, all 3M FP-301 tubing is split resistant, mechanically tough, easily marked and resists cold flow. 3M FP-301 tubing is rated for continuous operation at -55°C (-67°F) to 135°C (275°F), and is designed to withstand elevated temperatures to 300°C (572°F) for short periods. Minimum shrink temperature for all 3M FP-301 tubing is 100°C (212°F).
Agency Approvals & Self Certifications	Meets requirements of: • SAE-AMS-DTL-23053/5, Class 1, Class 2 (Clear)* • AMS-3636, AMS-3637 • UL Recognized, File E-39100, at 600 volts maximum @ 125°C • CSA Certified, CSA LR38227, at 600 volts maximum @ 125°C ***Formerly MIL-I-23053/5 and MIL-DTL-23053/5** For RoHS information, please visit www.3M.com/ROHS
Applications	3M FP-301 tubing is typically used as a shrink-fit electrical insulation over cable splices and terminations. It is also used for lightweight wire harness covering, wire marking, wire bundling, component packaging and fire-resistant covering.
Shrink Ratio	3M FP-301 tubing has a 2:1 shrink ratio. When freely recovered, the tubing will shrink to 50% of its as-supplied internal diameter. The recovered wall thickness is proportional to the degree of recovery.

3M

3M™ Heat Shrink Tubing FP-301

Standard Sizes and Dimensions

Ordering Size (Nominal)	Expanded I.D. (Minimum) In.	(mm)	Recovered I.D. (Maximum In.	(mm)	Recovered Wall Thickness (Nominal) In.	(mm)
3/64	.046	(1,17)	.023	(0,58)	.016	(0,41)
1/16	.063	(1,60)	.031	(0,79)	.017	(0,43)
3/32	.093	2,36)	.046	(1,17)	.020	(0,51)
1/8	.125	(3,18)	.062	(1,57)	.020	(0,51)
3/16	.187	(4,75)	.093	(2,36)	.020	(0,51)
1/4	.250	(6,35)	.125	(3,18)	.025	(0,64)
3/8	.375	(9,53)	.187	(4,75)	.025	(0,64)
1/2	.500	(12,70)	.250	(6,35)	.025	(0,64)
3/4	.750	(19,05)	.375	(9,53)	.030	(0,76)
1	1.000	(25,40)	.500	(12,70)	.035	(0,89)
1-1/2	1,500	(38,10)	.750	(19,05)	.040	(1,02)
2	2.000	(50,80)	1.000	(25,40)	.045	(1,14)
3	3.000	(76,20)	1.500	(38,10)	.050	(1,27)
4	4.000	(101,60)	2.000	(50,80)	.055	(1,40)

3M™ Heat Shrink Tubing FP-301

Typical Properties

Not for specifications. Values are typical, not to be considered minimum or maximum. Properties measured at room temperature 73°F (23°C) unless otherwise stated.

Physical Property	Typical Value US units (metric)
Tensile Strength	2400 psi
Ultimate Elongation	400%
Longitudinal Change	±5%
Secant Modulus (2%)	13,000 psi
Specific Gravity	1.3 (Opaque) .93 (Clear)
Operating Temperature	-67° to 275°F (-55° to +135°C)
Shrink Temperature (minimum)	212°F (100°C)
Heat Aging (336 hrs. @ 175° C)	Elongation 175%
Heat shock (4 hrs. @ 250° C)	No dripping, flowing, cracking, passes mandrel wrap test
Low Temperature Flexibility (4 hrs @ -55° C)	No cracking
Scant Modules (2%)	13,000 psi
Flammability Self-extinguish, Meets UL 224 All-Tubing Flame Test (Except Clear)	Pass

Electrical Property (Test Method)	Typical Value
Dielectric Strength	900 V/mil
Volume Resistivity	10^{15} ohm/cm

Chemical Property (Test Method)	Typical Value
Corrosion Resistance (Copper mirror)	Non-corrosive
Fungus Resistance	Non-nutrient
Water Absorption	0.2%
Solvent Resistance	Excellent

Standard Colors

Black, Clear

Also available in Blue, Green, Red, White and Yellow. Price, MOQ and Lead Time will vary for these colors. Please contact Local Sales Representative or Customer Service Representative for more information.

NOTE: The clear tubing is not flame retardant or UL listed.

3M™ Heat Shrink Tubing FP-301

Shelf Life & Storage	3M™ Heat Shrink Tubing FP-301 has a 10-year shelf life from date of manufacture when stored in a humidity controlled storage (10°C/50°F to 27°C/80°F and <75% relative humidity).
Availability	**Standard Packaging** Four-foot lengths, large spools (21" diameter) and small spools (8½" diameter). Please contact your local distributor; available from 3M.com/oem [Where to Buy] or call 1-800-676-8381.

Important Notice	All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product, which are not contained in 3M's current publications, or any contrary statements contained on your purchase order, shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.
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314-0017-05 Rev A

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CSA STANDARD 198
RoHS COMPLIANT

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GENERAL PURPOSE, IRRADIATED POLYOLEFIN

FIT®-221

Alpha Part No. And Size	Minimum Supplied I.D. Inches	mm	Maximum Recovered I.D. Inches	mm	Nom. Recovered Wall Thickness Inches	mm	Standard Packages 4 Ft. Lengths Total Ftg.	Spools Tot. Ftg.	Spools Tot. Ftg.	Spools Tot. Ftg.	No. Cut Pieces 6 Inch	No. Cut Pieces 1/2" or 1"
FIT-221-3/64	0.046	1,17	0.023	0,58	0.016	0,41	100	1000			40	1000
FIT-221-1/16	0.063	1,60	0.031	0,78	0.017	0,43	100	1000	100	70	36	1000
FIT-221-3/32	0.093	2,36	0.046	1,17	0.020	0,50	100	500	100	65	32	1000
FIT-221-1/8	0.125	3,18	0.062	1,58	0.020	0,50	100	500	100	60	28	1000
FIT-221-3/16	0.187	4,75	0.093	2,36	0.020	0,50	100	500	100	50	24	1000
FIT-221-1/4	0.250	6,35	0.125	3,18	0.025	0,63	100	250	100	40	20	1000
FIT-221-3/8	0.375	9,53	0.187	4,75	0.025	0,63	100	200	50	35	16	1000
FIT-221-1/2	0.500	12,70	0.250	6,35	0.025	0,63	20	150	50	32	14	-
FIT-221-3/4	0.750	19,10	0.375	9,53	0.030	0,76	20	250	50	24	12	-
FIT-221-1	1.000	25,40	0.500	12,70	0.035	0,88	20	250	50	16	8	-
FIT-221-1-1/2	1.500	38,10	0.750	19,10	0.040	1,02	20	125	-	-	5	-
FIT-221-2	2.000	50,80	1.000	25,40	0.045	1,16	20	125	-	-	3	-
FIT-221-3	3.000	76,20	1.500	38,10	0.050	1,27	8	100	-	-	2	-
FIT-221-4	4.000	101,60	2.000	50,80	0.055	1,40	8	50	-	-	1	-

SPOOL COLOR AVAILABILITY CHART

FIT-221 Tubing Size	Put-Up	Colors
3/64"	1000'	Black, Clear
1/16"	1000'	All Colors*
	100'	Black, Clear
	70'	All Colors
3/32"	500'	All Colors
	100'	Black, Clear
	65'	All Colors
1/8"	500'	All Colors
	100'	Black, Clear
	60'	All Colors
3/16"	500'	All Colors
	100'	Black, Clear
	50'	All Colors
1/4"	250'	All Colors
	100'	Black, Clear
	40'	All Colors

FIT-221 Tubing Size	Put-Up	Colors
3/8"	200'	All Colors
	50'	Black, Clear
	35'	All Colors
1/2"	150'	All Colors
	50'	Black, Clear
	32'	All Colors
3/4"	250'	All Colors
	50'	Black, Clear
	24"	All Colors
1"	250"	All Colors
	50"	Black, Clear
	16"	All Colors
1-1/2"	125'	Black, Clear
2"	125'	Black, Clear
3"	100'	Black, Clear
4"	50'	Black, Clear

*All colors include black, white, clear, red, yellow, blue, green

SEE PAGE 116
FOR
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Transport Canada	**Date:** April 15, 2018
Declaration of the Holder Understanding the Responsibility	**Approval #** SH06-24 Issue #5

Statement

Reference: STC SH06-24 Issue No: 5 - Installation of Helitowcart BearPaw

The reference STC has been issued to:

Aero Design Ltd
9888 A Malaspina Rd.
Powell River, BC, Canada
V8A 0G3

as the registered holder. As required by the Canadian Aviation Regulation it is duly declared that Aero Design Ltd. understand the responsibilities of a Design Approval Document Holder as defined in CAR 521, Division VIII.

Note: This document must be filled and return to:

ATTN: Mirko Zgela (DAR #310)
Email: mirko.zgela@aviatikasolutions.com
4100 Renoir, Trois-Rivières
Québec, Canada
G8Y 6Y6

Jason Rekve — Name

Jason Rekve — Signature

16 Apr 2018 — Date

President/PRM/M1/M2 AME — Title

REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
April 04, 2018	F	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.
August 09, 2013	E	Addition of Robinson R66 helicopter, removal of pocket version of the BearPaw and removal of revision letters from part numbers.
April 15, 2010	D	Addition of a rear U shaped clip in the Streamline BearPaw Pad configuration.
October 22, 2009	C	Introduction of new streamline BearPaw Pad configuration as alternate.
September 7, 2006	B	- Added filler blocks and heat shrink to product list. - Modified recommended bolt models (lengthened) - Revised inspection requirements from 100 hour to 300 hour intervals. - Identification of the IceBlade assembly as an optional feature.
June 12, 2006	A	Initial issue

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	06 June 2018

Annex A

See: BearPaw Assembly, drawing no. 112-0001-00.

Annex B

See: BearPaw Allowable Damage Drawing, drawing no. 314-0001-01 page 3 of 3.

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www.aerodesign.ca info@aerodesign.ca

REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
Nov 20,2006	A	Initial issue
Jan 29, 2007	B	Minor editorials. Change to weight & Balance Data to reflect production model. Change in inspection schedule from 300 to 500 hours to match existing landing gear periodicity.
Feb 28, 2008	C	Introduction of new streamline BearPaw Pad configuration as alternate.
Aug 01, 2008	D	Modification of vent holes on the streamline pad
April 8, 2010	E	Correction to C of G data
December 21, 2012	F	Updated Pad Tolerances and Document identifications . Improved page set up for reader convenience.
April 29, 2016	G	Added recesses for skid wear shoes and leaf spring on streamline BearPaw and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.
10 April, 2018	H	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	06 June 2018

Annex A – BearPaw Assembly Drawing

See: BearPaw Assembly, dwg no. (112-0002-00) for Pocket style pad or;
BearPaw Assembly, dwg no. (112-0002-00-S) for Streamline pad

Annex B – Tolerance Zones for Cracks and Wear

See: BearPaw Pad, dwg no. 314-0018-01 (VNR106) for Pocket style pad;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev A to D for Streamline pad without recess;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev E for Streamline pad with recesses.

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E	0,05 (FWD) 0.625 (AFT)	0,050 0,075	Holes: NO cracks around the holes.

Overhaul Requirements

- Not applicable for the designated application of this device.

REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
May 04,2011	A	Initial issue
April 10, 2018	B	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan, TCCA Pacific Region	06 June 2018

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Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	06 June 2018

Annex A – BearPaw Assembly Drawing

See: BearPaw Assembly, dwg no. (112-0002-00) for Pocket style pad or;
BearPaw Assembly, dwg no. (112-0002-00-S) for Streamline pad

Annex B – Tolerance Zones for Cracks and Wear

See: BearPaw Pad, dwg no. 314-0018-01 (VNR106) for Pocket style pad;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev A to D for Streamline pad without recess;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev E for Streamline pad with recesses.

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REVISIONS & APPROVAL

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June 12, 2006	A	Initial issue

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	06 June 2018

Annex A

See: BearPaw Assembly, drawing no. 112-0001-00.

Annex B

See: BearPaw Allowable Damage Drawing, drawing no. 314-0001-01 page 3 of 3.

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Transport Canada / Transports Canada

DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur	Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel	Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	

Identification of aeronautical product / Identification du produit aéronautique

Make / Marque	Model / Modèle	Registration / Immatriculation	Serial No. / N° du série	Part No. / N° de la pièce
See remarks	See remarks	All eligible	All eligible	

Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)

- ☐ STC / CTS
- ☐ STC (single serial number) / CTS (numéro de série simple)
- ☐ STC (multiple serial numbers) / CTS (numéros de série multiples)
- ☐ Type Certificate Revision / Revision de certificat de type
- ☑ Revision / Révision — No. / N° SH06-24 — Current Issue / Édition active 4
- ☐ Repair Design Approval (RDA) / Approbation de la conception de réparation (ACR)
- ☐ Repair Design Approval - Process Repair / ACR - Processus de réparation
- ☐ Part Design Approval (PDA) / Approbation de la conception de pièce (ACP)

Type Design Examination by Foreign Authority / Examen de la définition de type par autorité étrangère

- ☐ Application to a foreign authority is requested / La demande à une autorité étrangère est demandée.
- ☐ Type design examination of foreign change / Examen de la définition de type modification étrangère

Identify / Identifier

- ☐ Restricted Category / Catégorie restreinte — Type of Operation / Type d'opération

Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details.
Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.

Installation of BearPaws
Installation of a pad on the aft end of the landing gear skid tubes to help distribute the weight of the helicopter on soft ground.

Applicable Type Certificate (TC) / Certificat de type (CT) pertinent

TC No. / N° de CT	Issue No. / N° de l'édition	Identify State of Design / Identifier l'état de conception
H-83, H-87, H-97, H-111	23, 9, 8, 2	EASA, FAA

The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contôle de la fabrication du produit

☑ Yes / Oui ☐ No / Non — If no, identify who is responsible / Si non, identifier qui est responsable

Documentation to be submitted Documentation à soumettre	Applicant Demandeur Submitted Soumis Yes Oui	No Non
Proposed certification basis Proposition de base de certification		✓
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)		✓

Applicant's remarks / Remarques du demandeur

Application is to transfer holder from Helitowcart (Vanair Inc.) to Aero Design Ltd.
Make/Model: Airbus Helicopters - AS350/AS355 (all models), EC130B4; Robinson R44, R44II, R66

I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges).

Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).

Name and Signature of Applicant / Nom et signature du demandeur	Title / Poste	Date (yyyy-mm-dd) / Date (aaaa-mm-jj)
Jeff Clarke · JEFF CLARKE	VICE PRESIDENT	2018-04-09

Canada

Aero Design Ltd.

9888A Malaspina Road
Powell River, BC, V8A 0G3
Phone: 604-483-2376
Fax: 604-483-2372
www.aerodesign.ca

DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Helicopter Bear Paws Installation, as detailed in the data approved by Transport Canada on approval SH06-24, Issue 5, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file Q-18-0046 as shown.

Aero Design Ltd.

per: _____
Signature

Jeff Clarke	Vice President	31 May 2018
Print Name	Title	Date

Master Document List

Airbus Helicopters Model EC 130 B4 Helicopters
Installation of BearPaw Model BP130

Report: MDL-BP-EC130-1000 (Rev B)

APPROVED BY: _____ DATE: APRIL 10, 2018

Michael Chan
TCCA Pacific Region

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
www.aerodesign.ca info@aerodesign.ca

Revision	Revision Date	Revision of Entry	Entered by
A	May 13, 2011	Initial issue	N/A
B	April 10, 2018	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	B.J.C.

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	B	TCCA Pacific Region	Apr 10, 2018

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
VNR084	BearPaw – Iceblade	R01	DAR 310	Apr 24, 2006
VNR085	BearPaw – Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0015-01	Filler Block 1/8"	A	DAR 310	Aug 8, 2006
112-0005-00	BearPaw BP130 – Assembly	A	DAR 310	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	A	DAR 310	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	A	DAR 310	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	A	DAR 310	May 04, 2011

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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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INTRODUCTION

Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the BearPaw Model BP 130 (P/N 112-0005-00) for the EC130-B4 helicopters.

General

The BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the BearPaw system shall be directed to Customer Support as indicated in Table (1):

Table 1 – Customer Support

Care of	Mailing Address	Phone & Email:
Customer Support BearPaws Aero Design Ltd.	9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Tel:1 (604) 483-2376 info@aerodesign.ca

Helicopter Effectivity

This installation instruction applies to the following helicopter models:

Table 2 – Helicopter Model Effectivity

Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	EC 130 B4	H-83

Installer Responsibilities

The installer shall ensure that the installation of the Helitowcart BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different Helitowcart BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

INSTALLATION

BearPaw Installation

Reference Documentation:

[1] Helicopter Maintenance Manual EC130 as applicable.

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Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);
- Remove Aft AN5 bolt;

Note:	The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the skid tube wear shoes.

Step 2: IceBlade Installation

Note:	The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the IceBlades

- With IceBlade Option
- Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0005-00) provided at Annex A.
- Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

Step 3: BearPaw Installation

- Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.
- Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);
- Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0005-00) provided at Annex A;
- Insert filler blocks (P/N314-0015-01) in the six bolts as per drawing (112-0002-00) provided at Annex A;

Note:	The use of filler blocks (P/N314-0015-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

- Insert both U-shaped clips (P/N 314-0026-15) through forward bolts: 4x(261-0001-17);
- Insert both L-shaped clips (P/N 314-0025-15) through aftward bolts: 2x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb;
- Re-install removed AN-5 Bolt from step one;
- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.

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Figure 1 – BearPaw Model BP130 (P/N 112-0005-00) - Alignment on Skid

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BearPaw Removal

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

Step 2: BearPaw Removal

- Remove aftward AN5 bolt;
- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0026-15)2x and L-shaped clips (P/N 314-0025-15);
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), L-shaped clips (P/N 314-0025-15), filler blocks (P/N314-0015-01) and remove BearPaw pad (P/N 314-0024-01);
- Inspect skid tubes to confirm serviceability;
- Re-install aftward AN5 bolt;
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;
- Amend Weight & Balance records as required using data provided in Table 3.

Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 – Weight & Balance Data

Item	Weight	Lateral		Longitudinal	
		Arm	Moment	Arm	Moment
BearPaw Model BP130 (P/N 112-0005-00)	20.0 Lb 9.1 Kg	N/A	N/A	182.2 in. 462.9 cm	3644.0 in-lb 42.12 m-kg

Note: Weight and moment provided are for full kit installation.

Parts Lists

The Helitowcart BearPaw detailed parts list is as follow:

Table 4 – Parts List

Description	Qty	Part No.	Drawing no./name
BearPaw Model BP130	1	112-0005-00	BearPaw BP130 Assembly
BearPaw Pad	1	314-0024-01	BearPaw BP130 – Pad
U Shaped Clips	2	314-0026-15	BearPaw BP130 - U Shaped Clips
L Shaped Clips	2	314-0025-15	BearPaw BP130 - L Shaped Clips
Slotted Clip Support	6	314-0007-15	BearPaw - Slotted Clip Support
Filler blocks 3/32"	6	314-0015-01	BearPaw – Filler block 1/8"
Bolts	6	261-0001-17	Bolt- AN4-14
Nuts	6	262-0001-17	Nut- MS20365-428

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Washers	12	263-0001-17	Washer – AN960-416
Shrink	3	314-0021-01	BearPaw – Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	**4**	**314-0005-15**	**VNR086 / IceBlade Assembly**
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer – AN960-416

INSPECTION

Life Limited Items

Three are no life limited items for the BearPaw.

Pre-Flight

Before each flight the following items should be inspected:

- Check that attachment bolts are installed and secured,
- Check that BearPaws are free from visible damage,
- If damage is found, verify allowable damage according to:
  Table 5 – Tolerances for cracks & wear and
  Annex B – BearPaw BP130 Allowable Damage Drawing

Periodic Inspection Schedule

- The BearPaw shall be inspected every 500 flying hours or yearly whichever comes first.
- The BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 500 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections shall be scheduled not to exceed the above mentioned tolerance.

500 Hour or Yearly Inspection Details

- Remove Helitowcart BearPaw: See Section "BearPaw Removal",
- Inspect all parts for damage & wear. See table & figure below for allowable damage,
- Replace all damaged parts,
- Replace parts worn beyond the tolerances indicated below.
- See Tolerances for cracks & wear:
  Table 5 – Tolerances for cracks & wear, &
  Annex B – BearPaw BP130 Allowable Damage Drawing

Table 5 – Tolerances for Cracks & Wear

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,50	0,050	
B	1,000	0,250	
C	0,625	0,075	Stiffeners: NO cracks allow in the radius.
D	0,50	0,050	

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E	0,05 (FWD) 0.625 (AFT)	0,050 0,075	Holes: NO cracks around the holes.

Overhaul Requirements

- Not applicable for the designated application of this device.

REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
May 04,2011	A	Initial issue
April 10, 2018	B	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.

Approval

Internal Approval :		
Helitowcart inc.	Jeff Clarke, Vice President	(date)
External Approval :		
Transport Canada	Michael Chane, TCCA Pacific Region	(date)

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Annex A
BearPaw Assembly, Drawing no. (112-0005-00)

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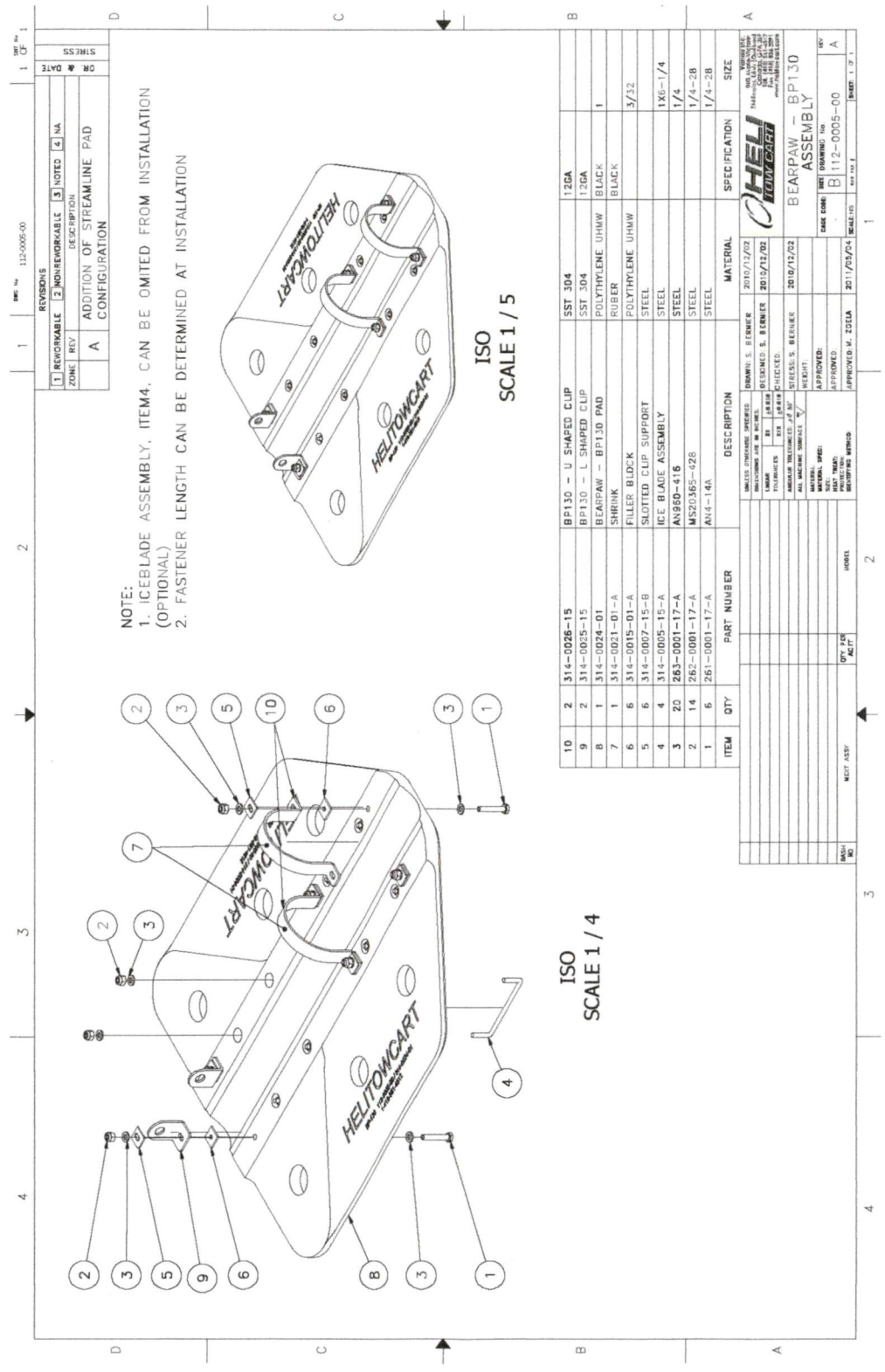

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Annex B
BearPaw Pad, Drawing no. 314-0024-01 Page 4 of 4.

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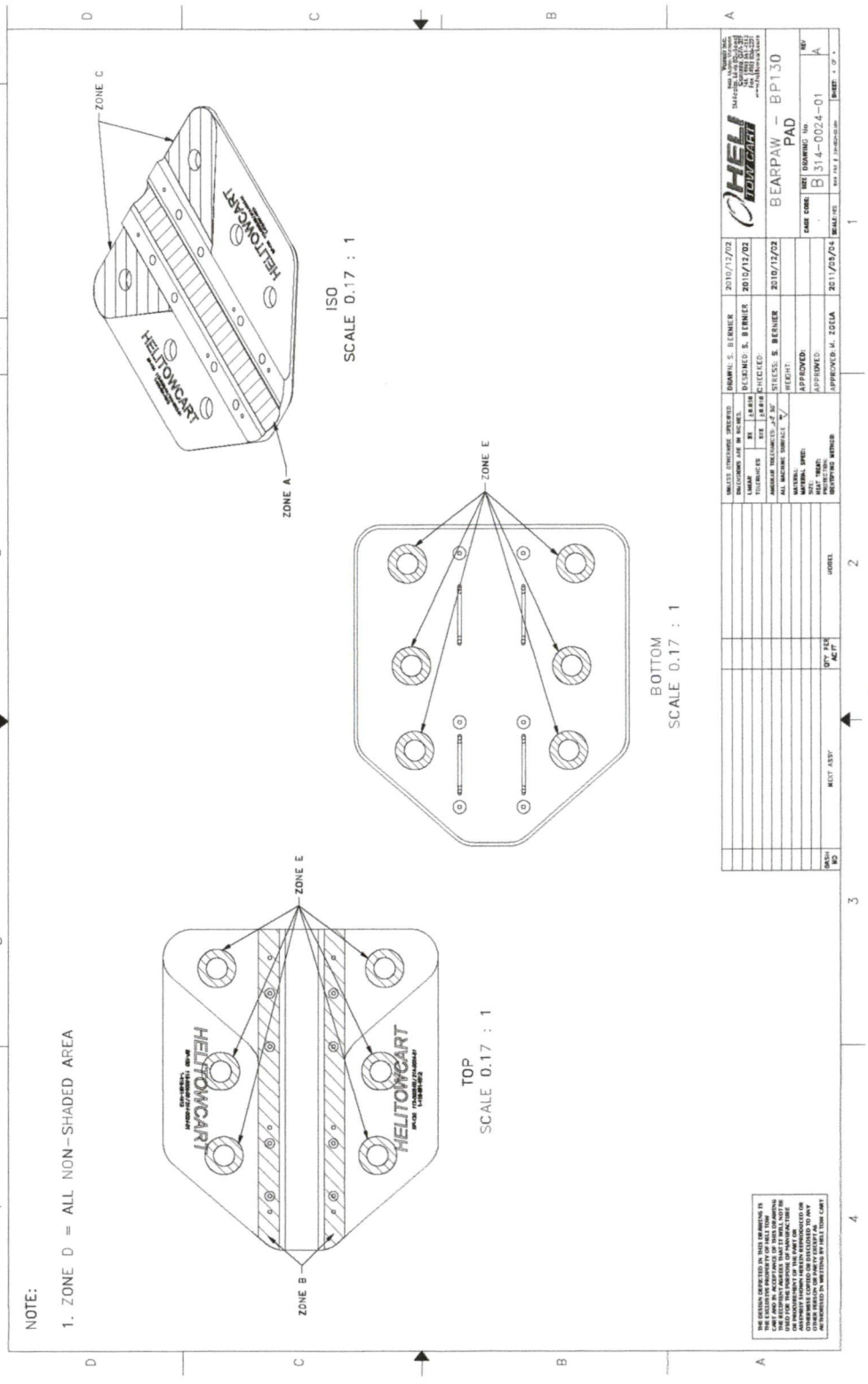

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Master Document List

Airbus Helicopters Model AS 350/355 Series Helicopters
Installation of BearPaw Model BP350

Report: MDL-BP-AS350/355-1000 (Rev I)

APPROVED BY: _____ DATE: APRIL 10, 2018

Michael Chan
TCCA Pacific Region

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Revision	Revision Date	Revision of Entry	Entered by
A	Nov 22, 2006	Initial issue	N/A
B	Jan 28, 2007	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
C	Feb 28, 2007	Addition of streamline pad configuration. Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
D	July 27, 2008	Addition of vents holes in the streamline pad.	M.Z.
E	Aug 01, 2008	Modification of vents holes in the streamline pad.	M.Z.
F	April 8, 2010	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
G	December 21, 2012	Updated Tolerance data regarding Pad and Updated referenced document identification and revisions	M.Z.
H	May 30, 2016	Added recesses for skid wear shoes and leaf spring on streamline BearPaw (Dwg # 314-0018-01-S) and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.	M.Z.
I	April 10, 2018	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	B.J.C.

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
314-0020-00-E	BearPaw Model BP350 – Installation Instruction – AS350/355 Series Helicopters	H	TCCA-Pacific	April 10, 2018
AAC-STR-BP-AS350/355-1000	Structural Substantiation – Helitowcart Inc. BearPaw Model BP350	NC	DAR 310	Nov 20, 2006
AAC-FTR-C-GZNC	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Nov 21, 2006
HTS-EO-0709-002	Bear Paw Model BP350 Vent Holes	A	DAR 310	July 31, 2008
HTC-MEM-0709-001	Memorandum – Vent Hole BP350 BearPaw	A	DAR 310	July 31, 2008
HTC-TM-0709-001	Structural Substantiation – BearPaw Streamline BP350 with Recesses Wear Pads	NC	DAR 310	May 30, 2016

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0002-00	BearPaw BP350 - Assembly	B	DAR 310	Nov 20, 2006
112-0002-00-S	BearPaw BP350 – Assembly Streamline	E	DAR 310	May 30, 2016
314-0002-15 (VNR084)	BearPaw – Iceblade	A (R01)	DAR 310	Apr 24, 2006
314-0004-15 (VNR085)	BearPaw – Iceblade Threaded Rod	A (R01)	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0012-01 (VNR099)	Filler Block ¼"	A (R01)	DAR 310	Aug 8, 2006
314-0018-01 (VNR106)	BearPaw BP350 - Pad	B (R02)	DAR 310	Sept 26, 2006
314-0018-01-S (VNR106-S)	BearPaw BP350 – Pad Streamline	E	DAR 310	May 30, 2016
314-0019-15 (VNR107)	BearPaw BP350 – U Shaped Clip	A (R01)	DAR 310	Sept 29, 2006

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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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Annex A (BearPaw Assembly Drawing)
Annex B (Tolerance Zones for Cracks and Wear)

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INTRODUCTION

Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the BearPaw Model BP 350 (P/N 112-0002-00 or P/N 112-0002-00-S) for the AS 350 and AS 355 series helicopters.

General

The BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the BearPaw system shall be directed to Customer Support as indicated in Table (1):

Table 1 – Customer Support

Care of	Mailing Address	Phone & Email:
Customer Support BearPaws Aero Design Ltd.	9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Tel:1 (604) 483-2376 info@aerodesign.ca

Helicopter Effectivity

This installation instruction applies to the following helicopter models:

Table 2 – Helicopter Model Effectivity

Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	AS 350 D	H-83
Eurocopter	AS 350 D1	
Eurocopter	AS 350 B	
Eurocopter	AS 350 B1	
Eurocopter	AS 350 B2	
Eurocopter	AS 350 B3	
Eurocopter	AS 350 BA	
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	
Eurocopter	AS 355 F1	
Eurocopter	AS 355 F2	
Eurocopter	AS 355 N	

Installer Responsibilities

The installer shall ensure that the installation of the BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

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INSTALLATION

BearPaw Installation

Reference Documentation:
[1] Helicopter Maintenance Manual AS 350 or AS 355 as applicable.

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

> **Note:** The BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) can be installed with or without the skid tube wear shoes.

Step 2: IceBlade Installation

> **Note:** The BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) can be installed with or without the IceBlades

- With IceBlade Option
- Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A.
- Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

Step 3: BearPaw Installation

- Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.
- Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);
- Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A;
- Insert filler blocks (P/N314-0012-01) as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A;

> **Note:** The use of filler blocks (P/N314-0012-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

- Insert both U-shaped clips (P/N 314-0019-15) through bolts: 6x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb;
- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.

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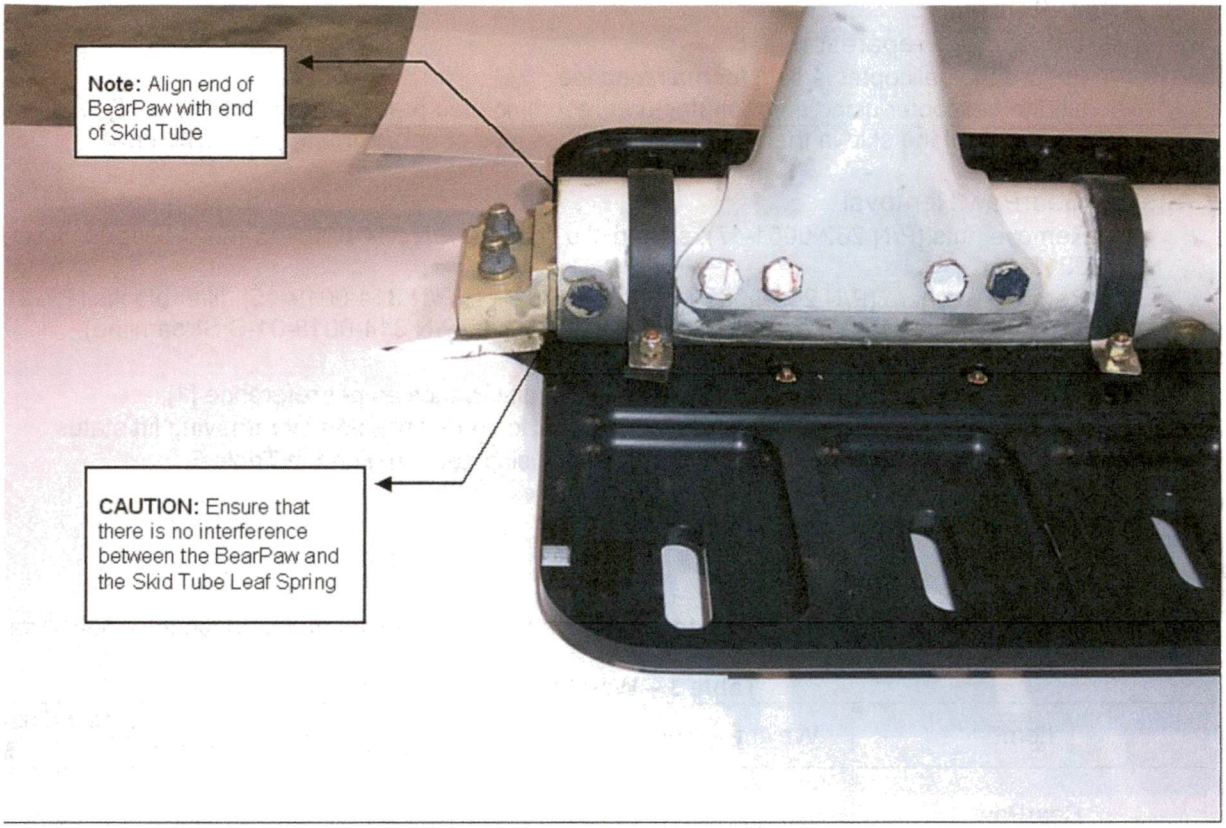

Figure 1 – BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) - Alignment on Skid

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BearPaw Removal

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

Step 2: BearPaw Removal

- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0019-15),
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), filler blocks (P/N314-0012-01), and remove BearPaw pad (P/N 314-0018-01) or (P/N 314-0018-01-S Streamline);
- Inspect skid tubes to confirm serviceability
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;
- Amend Weight & Balance records as required using data provided in Table 3.

Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 – Weight & Balance Data (1)

Item	Weight	Lateral		Longitudinal	
		Arm	Moment	Arm	Moment
BearPaw Model BP350 (P/N 112-0002-00)	19,9 Lb 9,0 Kg	N/A	N/A	159,4 in. 404.9 cm	3172.0 in-lb 36.44 m-kg
BearPaw Model BP350 - Streamline (P/N 112-0002-00-S)	18,3 Lb 8,5 Kg	N/A	N/A	159,4 in. 404.9 cm	2917.0 in-lb 34.41 m-kg

Notes:

(1) Weight and moment provided are for full kit installation (two BearPaw assemblies).

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Parts Lists

The BearPaw detailed parts list is as follows.

Table 4 – Part List (one BearPaw)

Description	Qty	Part / Dwg No.	Additional Drawing Reference No./ Name
BearPaw Assembly Model BP350	1	112-0002-00 or 112-0002-00-S	BearPaw Assembly – Pocket Style, or Bear Paw Assembly – Streamline
BearPaw Pad(1) Model BP350	1	314-0018-01 or 314-0018-01-S	BearPaw BP350 – Pocket Style Pad (VNR106) or BearPaw BP350 – Streamline Pad (VNR106-S)
U Shaped Clips	3	314-0019-15	BearPaw BP350 - U Shaped Clips (VNR107)
Slotted Clip Support	6	314-0007-15	BearPaw - Slotted Clip Support (VNR089)
Filler blocks 1/4"	6	314-0012-01	BearPaw – Filler block ¼" (VNR099)
Bolts	6	261-0001-17	Bolt- AN4-14
Nuts	6	262-0001-17	Nut- MS20365-428
Washers	12	263-0001-17	Washer – AN960-416
Shrink	3	314-0021-01	BearPaw – Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	4	314-0005-15	IceBlade Assembly (VNR086)
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer – AN960-416

Note (1): Use pocked shaped BearPaw Pad P/N 314-0018-01 for assembly P/N 112-0002-00. Use streamlined Pad P/N 314-0018-01-S for assembly P/N 112-0002-00-S as applicable.

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INSPECTION

Life Limited Items

There are no life limited items for the BearPaw.

Pre-Flight

Before each flight the following items should be inspected:

- Check that attachment bolts are installed and secured,
- Check that BearPaws are free from visible damage,
- If damage is found, verify allowable damage according to Tables 5 & 6 and Annex B – Tolerances for cracks & wear

Periodic Inspection Schedule

- The BearPaw shall be inspected every 600 flying hours or yearly whichever comes first.
- The BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 600 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections shall be scheduled not to exceed the above mentioned tolerance.

600 Hours or Yearly Inspection Details

- Remove BearPaw: See Section "BearPaw Removal",
- Inspect all parts for damage & wear. See Tables 5 & 6 and Annex B – Tolerances for cracks & wear.
- Replace all parts damaged beyond tolerances.

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Table 5 – Tolerances for Cracks & Wear / Pocket Pad 314-0018-01 (VNR 106)

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,50	0,050	
B	1,000	0,250	
C	0,375	0,075	Pockets: Cracks are acceptable in the BearPaw pocket areas to a maximum length of 0,5" provided they are 0,25" away from the stiffener radius change. Stop drill cracks with a 0,125" hole.
D	0,50	0,050	Stiffeners: NO cracks in stiffeners.

Table 6 – Tolerances for Cracks & Wear / Streamline Pad 314-0018-01-S (VNR 106-S)

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,50	0,050	
B	1,000; and 0.88	0,250	
C	0.273 to 0,348 (variable thickness)	0,075	Cracks are acceptable in zone C under the BearPaw to a maximum length of 0,5". Stop drill cracks with a 0,125" hole.
D	0,49 (thickness after radius)	0,075	No cracks in the radius
E	0,38	0,075	No cracks in the BearPaw contour

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Pad Recesses for Skid Wear Shoes and Leaf Spring

BearPaw 314-0018-01-S may be trimmed/machined to clear wear shoe mounting screws and skid leaf spring provided the recesses leave at least 0.500" thickness and provided that maximum lengths and widths of Figure 2 are not exceeded.

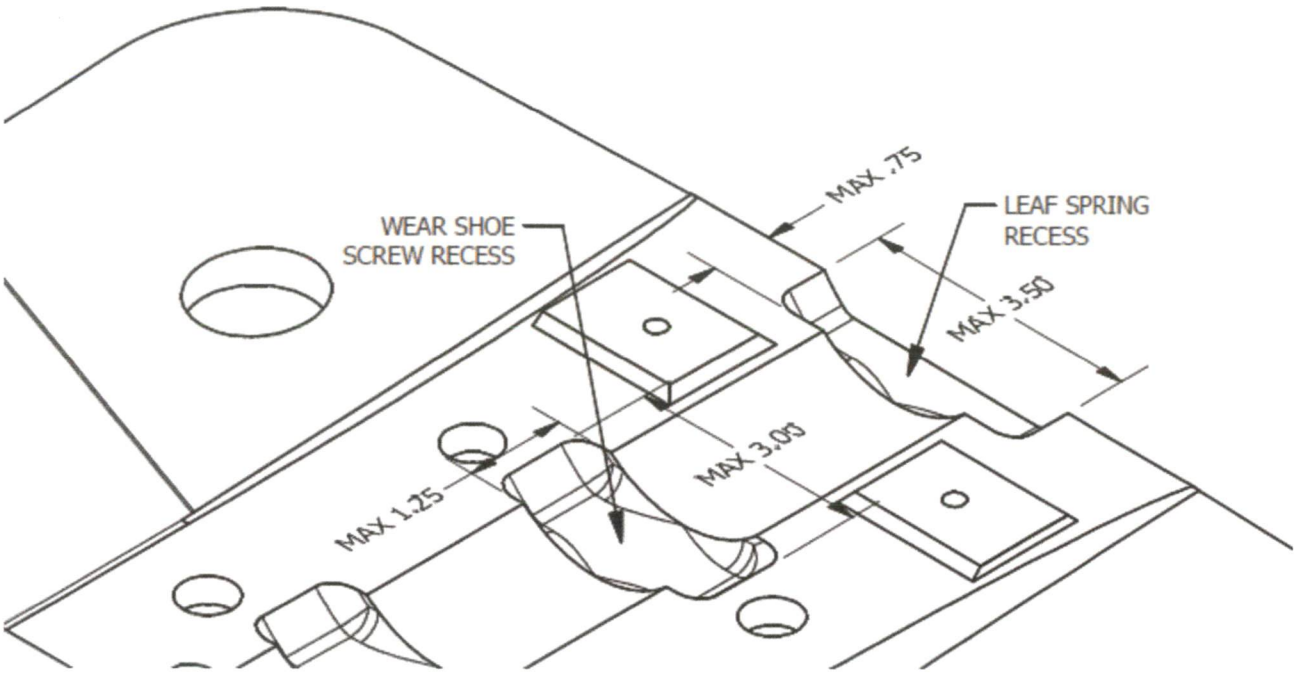

Figure 2 – Maximum Dimensions of Recesses

Overhaul Requirements

- Not applicable for the designated application of this device.

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REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
Nov 20,2006	A	Initial issue
Jan 29, 2007	B	Minor editorials. Change to weight & Balance Data to reflect production model. Change in inspection schedule from 300 to 500 hours to match existing landing gear periodicity.
Feb 28, 2008	C	Introduction of new streamline BearPaw Pad configuration as alternate.
Aug 01, 2008	D	Modification of vent holes on the streamline pad
April 8, 2010	E	Correction to C of G data
December 21, 2012	F	Updated Pad Tolerances and Document identifications . Improved page set up for reader convenience.
April 29, 2016	G	Added recesses for skid wear shoes and leaf spring on streamline BearPaw and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.
10 April, 2018	H	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	(date)
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	(date)

Annex A – BearPaw Assembly Drawing

See: BearPaw Assembly, dwg no. (112-0002-00) for Pocket style pad or;
BearPaw Assembly, dwg no. (112-0002-00-S) for Streamline pad

Annex B – Tolerance Zones for Cracks and Wear

See: BearPaw Pad, dwg no. 314-0018-01 (VNR106) for Pocket style pad;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev A to D for Streamline pad without recess;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev E for Streamline pad with recesses.

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Annex A – BearPaw Assembly Drawing

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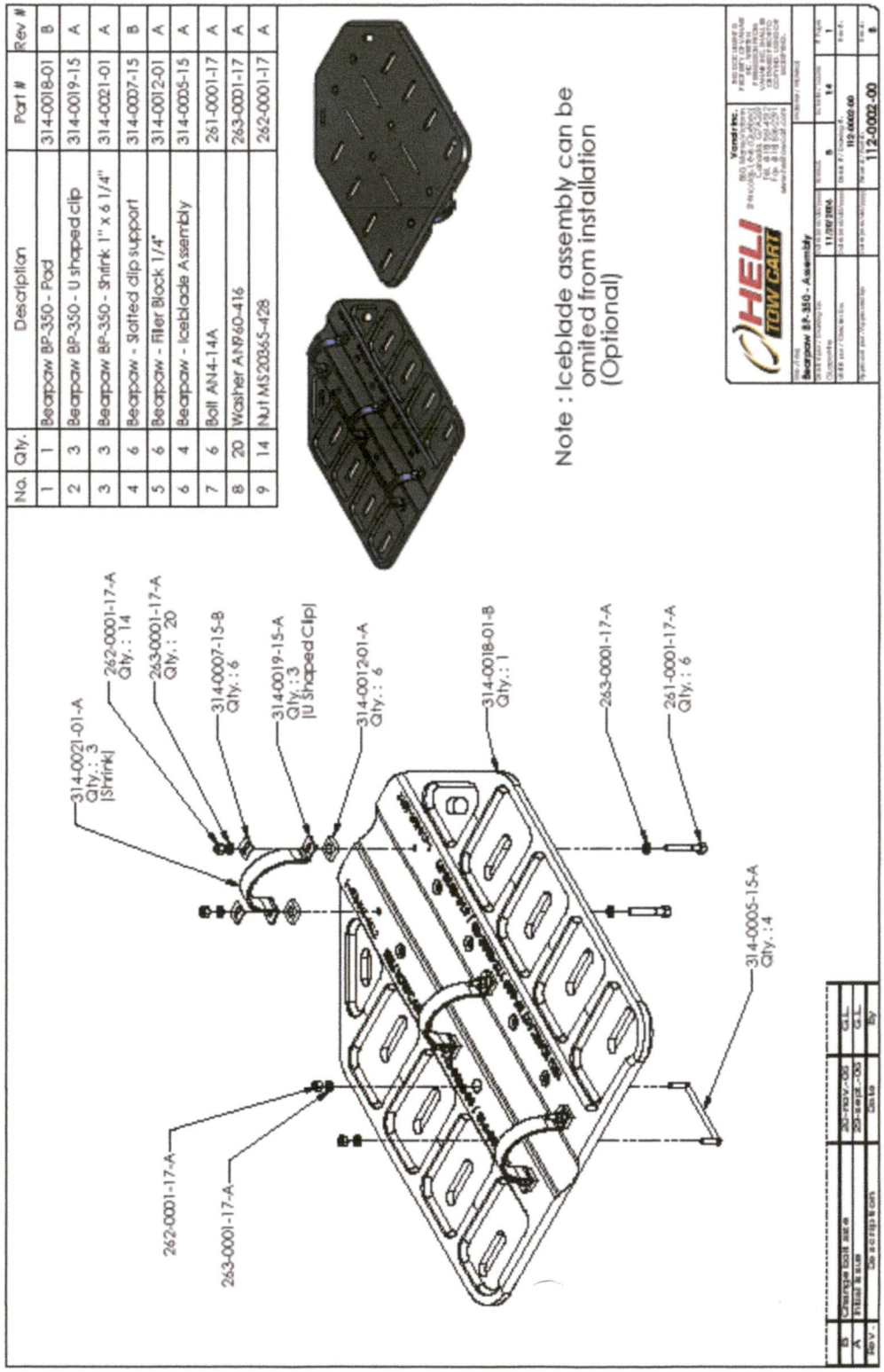
Pocket Style Pad – Dwg 112-0002-00

No.	Qty.	Description	Part #	Rev #
1	1	Bearpaw BP-350 - Pad	314-0018-01	B
2	3	Bearpaw BP-350 - U shaped clip	314-0019-15	A
3	3	Bearpaw BP-350 - Shrink 1" x 6 1/4"	314-0021-01	A
4	6	Bearpaw - Slotted clip support	314-0007-15	B
5	6	Bearpaw - filler Block 1/4"	314-0012-01	A
6	4	Bearpaw - Iceblade Assembly	314-0005-15	A
7	6	Bolt AN4-14A	261-0001-17	A
8	20	Washer AN960-416	263-0001-17	A
9	14	Nut MS20365-428	262-0001-17	A



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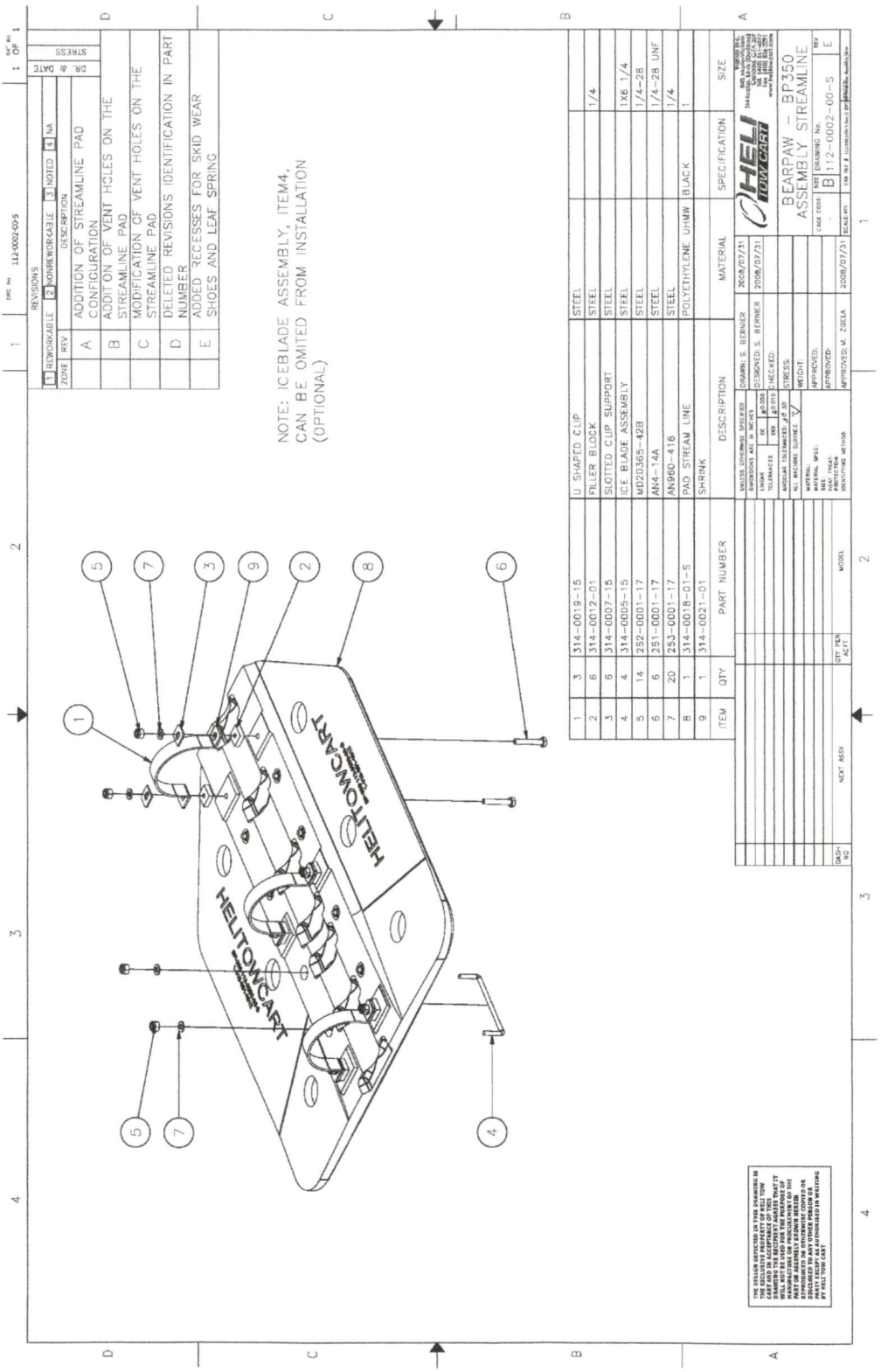
Streamline Pad – Dwg 112-0002-00-S



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Annex B – Tolerance Zones for Cracks and Wear

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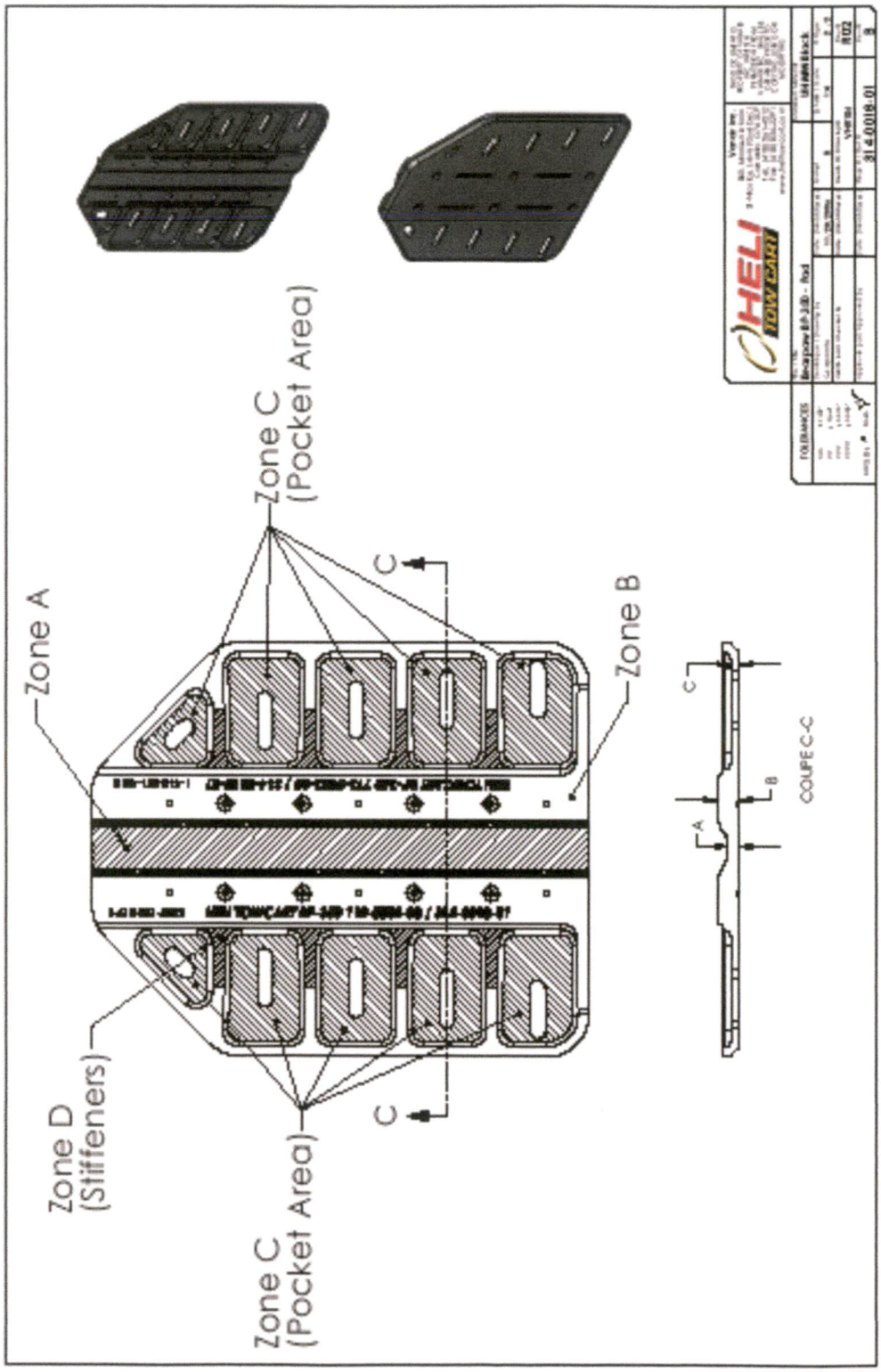
Pocket Style Pad – Dwg 314-0018-01 (VNR106) Page 2 of 2



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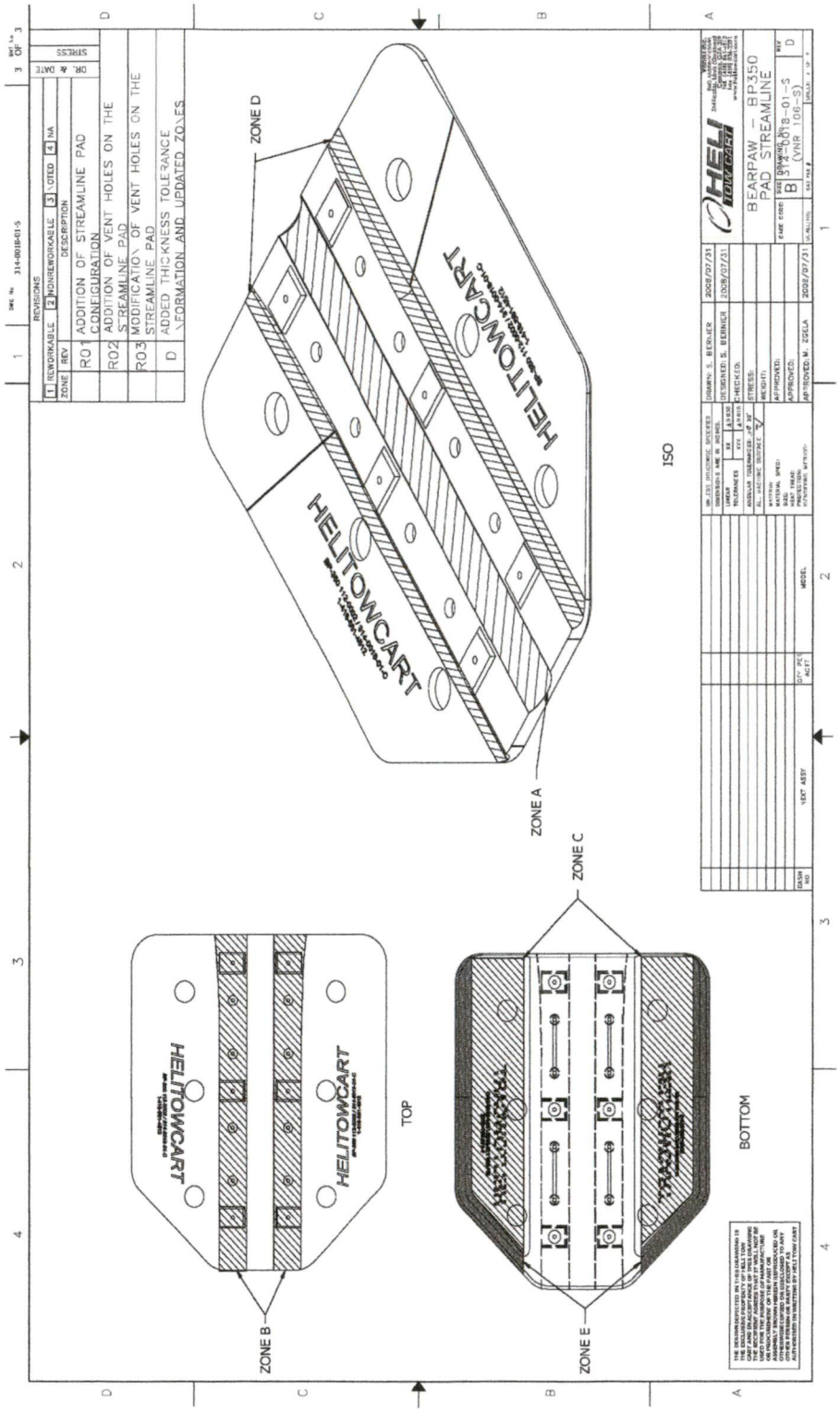
Streamline Pad w/o Recesses – Dwg 314-0018-01 (VNR106-S) Rev A to D



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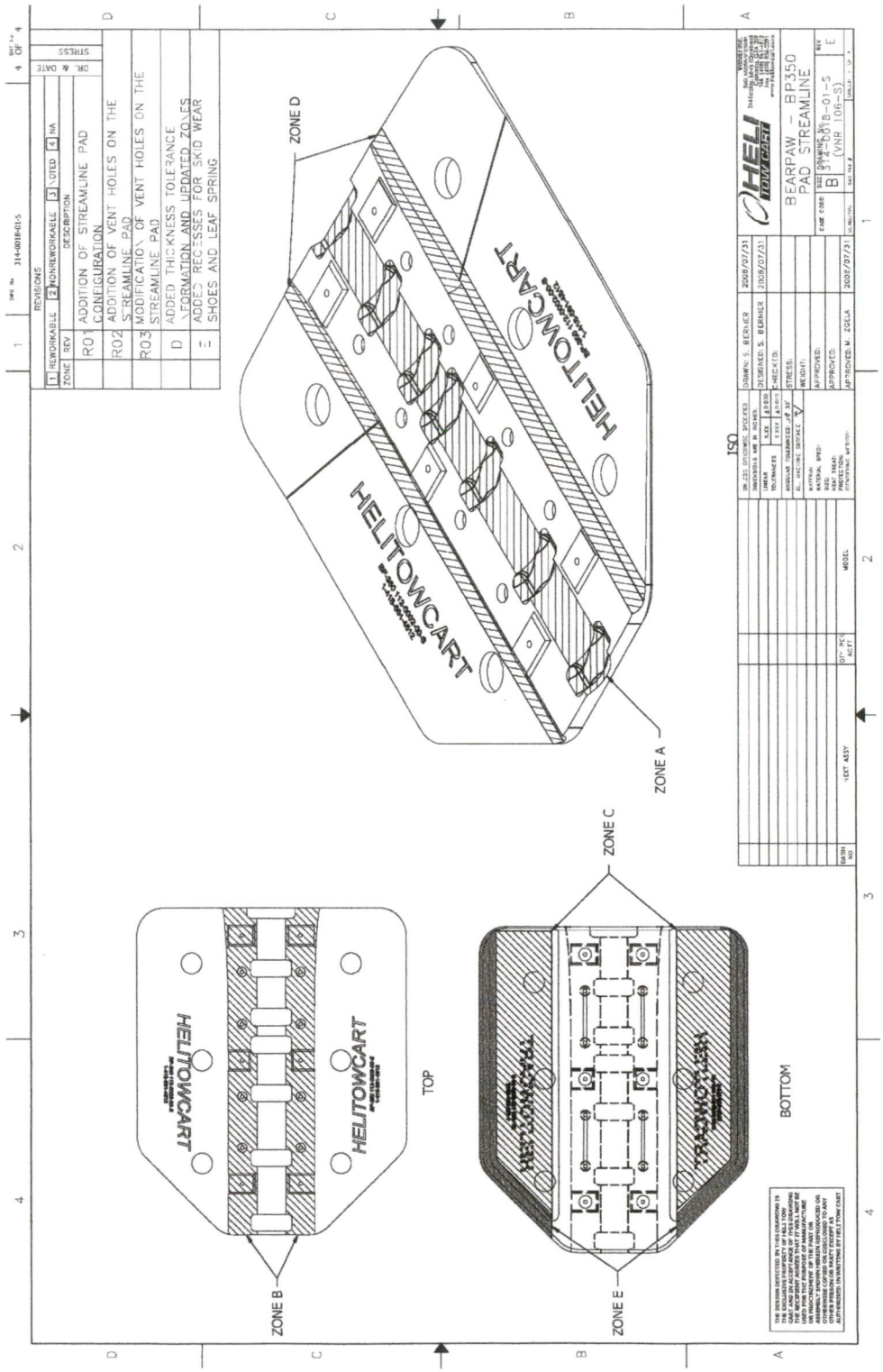
Streamline Pad with Recesses – Dwg 314-0018-01 (VNR106-S) Rev E



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Annex A (BearPaw Assembly Drawing)
Annex B (BearPaw Pad Allowable Damage Drawing)

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INTRODUCTION

Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the BearPaw BP44 on the Robinson R44 and R66 helicopters..

General

The BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance to your Robinson helicopter. Any question regarding the BearPaw system shall be directed to Aero Design Ltd. Customer Support as indicated in Table 1:

Table 1 – Customer Support

Care of	Mailing Address	Phone & Email:
Customer Support BearPaws Aero Design Ltd.	9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Tel:1 (604) 483-2376 info@aerodesign.ca

Helicopter Effectivity

This installation instruction applies to the following ROBINSON Helicopters:

Table 2 – Robinson Helicopter Effectivity

A/C Model	Serial no.	Type Certificate Data Sheet
R44	0002, 0004 thru 9999, except 1140	Transport Canada: H-97 FAA: H11NM
R44 II	1140, 10001 and subsequent	Transport Canada: H-97 FAA: H11NM
R66	0002 and subsequent	Transport Canada: H-111 FAA: R00015LA

Installer Responsibilities

The installer shall ensure that the installation of the BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

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INSTALLATION

BearPaw Installation

Reference Documentation:

[1] Robinson R44 – Maintenance Manual & Instruction for Continued Airworthiness. RTR460.
[2] Robinson R66 – Maintenance Manual & Instruction for Continued Airworthiness. RTR660.
[3] Annex A – BearPaw Assembly Drawings (112-0001-00)

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] or [2] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½ inch (38mm);
- Remove aft skid wearshoe & re-install the attaching screws.

Step 2: Ice Blade Installation (Optional)

- Install the two ice blades (314-0005-15) under BearPaw pad as per drawing 112-0001-00, ref [3];
- Insert washer (263-0001-17 / AN960-416) through threaded part of ice blade and secure with nut (262-0001-17 / AN365-428A).

Step 3: BearPaw Preparation

- Insert washers (263-0001-17 / AN960-416) through all six bolts: 2x(261-0001-17 / AN4-14A), 2x(261-0002-17 / AN4-15A) & 2x(261-0003-17 / AN4-16A) as per drawing 112-0001-00, ref [3];
- Insert all six bolts and washers through BearPaw pad;
- Insert rear filler block (314-0014-01) at aft of BearPaw;
- On each side at **front** of BearPaw, insert one 1/4" filler block (314-0012-01) and one 1/16" filler block (314-0014-01);
- On each side at **center** of BearPaw, insert one 1/8" filler block (314-0015-01) and one 1/16" filler block (314-0014-01);
- On each side at **aft** of BearPaw, insert **two** 1/16" filler blocks 2x(314-0014-01);

Note: Except for the rear filler block (314-0022-01) the use of filler blocks mentioned above may be increased, decreased, replaced or complemented by the use of washers (263-0001-17 / AN960-416). The use of bolts mentioned above may be replaced by longer or shorter AN4 bolts as required.

Step 4: BearPaw Installation

- Position the BearPaw under skid at the aft intersection with the cross tube with narrow edge pointing forward.
- Insert both U-Shaped Clips (314-0006-15) through bolts at front and center of BearPaw as per drawing 112-0001-00, ref [3];
- Insert the Low U-Shaped Clip (314-0023-15) through bolts at rear of BearPaw;
- Insert washer (263-0001-17 / AN960-416) & screw nuts (262-0001-17 / AN365-428A) for a tight fit. Maximum torque on nuts is 60 in.-lb.
- Adjust rear filler block (314-0022-01) position using slotted holes to remove all gap between rear filler block and skid.
- Ensure BearPaw holds strongly into position. If required, 1/16" filler blocks (314-0014-01) can be removed to increase tightening.

Step 5: Final Step

- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.

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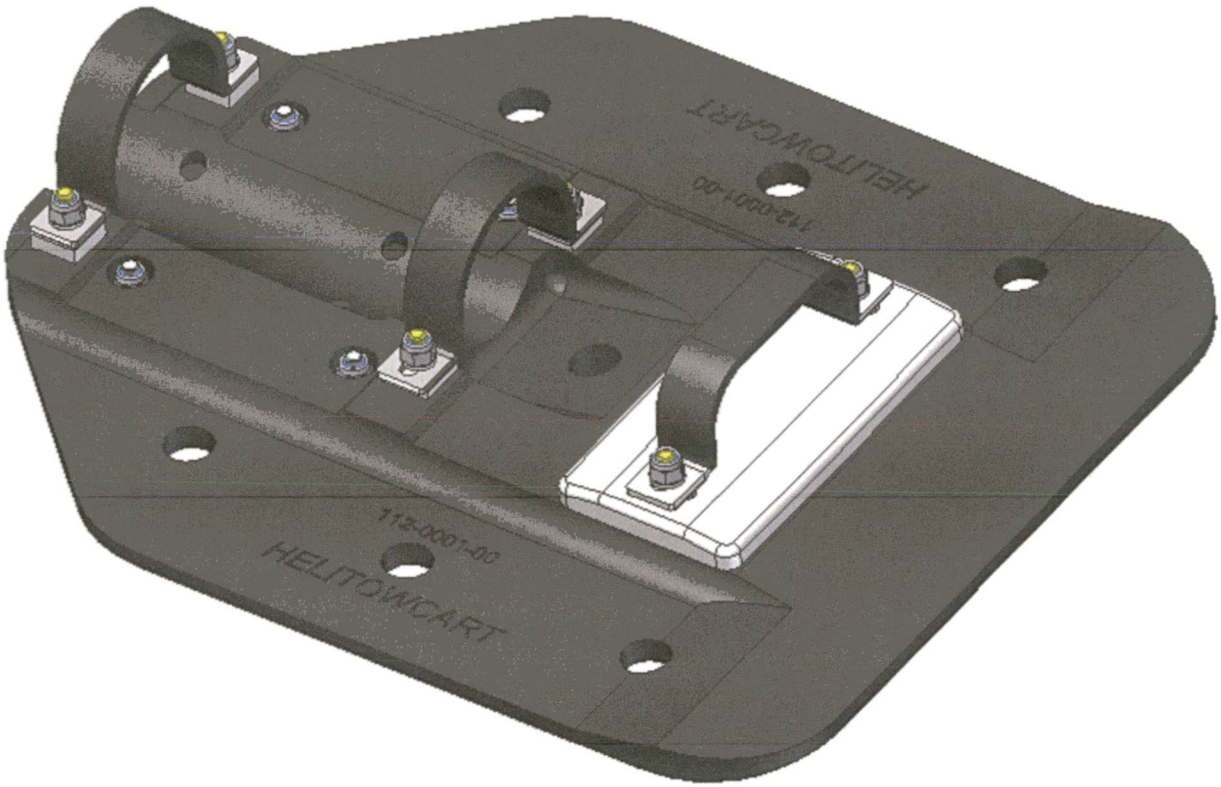

Figure 1 – BearPaw Model BP44/BP66 (112-0001-00)

BearPaw Removal

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] and [2] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½ inch (38mm);

Step 2: BearPaw Removal

- Remove nuts (262-0001-17 / AN365-428A), washers (263-0001-17 / AN960-416), U-Shaped Clips (314-0006-15) and Low U-Shaped Clip (314-0023-15);
- Remove BearPaw pad (314-0001-01);
- Inspect skid tubes to confirm serviceability;
- Re-install aft wearshoe with screws as per reference [1] or [2];
- Complete installation by putting helicopter back to normal position by removing lift status;
- Amend Weight & Balance records as required.

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Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 – Weight & Balance Data – R44, R44 II and R66 helicopters

Item	Weight	Lateral		Longitudinal	
		Arm	Moment	Arm	Moment
BearPaw Model BP44	10.0 lbs 4.54 kg	0.0 in. (0.00 m)	0.0 lbs-in (0.0 kg-m)	128.5 in (3.26 m)	1285 lbs-in (14.8 kg-m)

Parts Lists

The BearPaw detailed part list is as follow:

Table 4 – Parts List

Description	Qty	Part No.	Name
BearPaw Model BP44	**1**	**112-0001-00**	**BearPaw Assembly**
BearPaw pad	1	314-0001-01	BearPaw – Pad
Filler blocks rear	1	314-0022-01	BearPaw – Filler block Rear
Filler blocks 1/4"	2	314-0012-01	BearPaw – Filler block 1/4"
U-Shaped Clips	2	314-0006-15	BearPaw – U Shaped Clips
Filler blocks 1/16"	8	314-0014-01	BearPaw – Filler block 1/16"
Filler blocks 1/8"	2	314-0015-01	BearPaw – Filler block 1/8"
Low U-Shaped Clips	1	314-0023-15	BearPaw – Low U Shaped Clips
Washers	12	263-0001-17	Washer (AN960-416)
Nuts	6	262-0001-17	Nylon Nut (AN365-428A)
Bolts	2	261-0001-17	Hex Bolt (AN4-14A).
Bolts	2	261-0002-17	Hex Bolt (AN4-15A).
Bolts	2	261-0003-17	Hex Bolt (AN4-16A).
IceBlade Option Model OIB	**2**	**314-0005-15**	**IceBlade Assembly**
Nuts	4	262-0001-17	Nylon Nut (AN365-428A)
Washers	4	263-0001-17	Washer (AN960-416)

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INSPECTION

Life Limited Items

There are no life limited items for the BearPaw.

Pre-Flight

Before each flight the following items should be inspected:

- Check that attachment bolts are installed and secured;
- Check that BearPaws are free from visible damage;
- If damage is found, verify allowable damage according to:
  Table 5 – Tolerances for Cracks & Wear;
  Annex B – BearPaw Allowable Damage Drawing (314-0001-01 page 3 of 3).

Periodic Inspection Schedule

- The BearPaw shall be inspected every 300 flying hours or yearly whichever comes first;
- The BearPaw can be inspected concurrently with the R44/R66 landing gear inspection;
- Recommended tolerance for performance of inspection is +/- 10% of the 300 hours period.;
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections shall be scheduled not to exceed the above mentioned tolerance.

300 Hour or Yearly Inspection Details

- Remove BearPaw: See Section "BearPaw Removal";
- Inspect all parts for damage & wear. See table & figure below for allowable damage;
- Replace all damaged parts;
- Replace parts worn beyond the tolerances indicated below;
- See Tolerances for cracks & wear:
  Table 5 – Tolerances for cracks & wear;
  Annex B – BearPaw Allowable Damage Drawing (314-0001-01 page 3 of 3).

Table 5 – Tolerances for Cracks & Wear

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,350	0,050	
B	1,000	0,250	
C	0,375	0,050	
D	N/A	N/A	No cracks allowed in zone D
E	N/A	N/A	No cracks allowed in zone E

Overhaul Requirements

- Not applicable for the designated application of this device.

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REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
April 04, 2018	F	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.
August 09, 2013	E	Addition of Robinson R66 helicopter, removal of pocket version of the BearPaw and removal of revision letters from part numbers.
April 15, 2010	D	Addition of a rear U shaped clip in the Streamline BearPaw Pad configuration.
October 22, 2009	C	Introduction of new streamline BearPaw Pad configuration as alternate.
September 7, 2006	B	- Added filler blocks and heat shrink to product list. - Modified recommended bolt models (lengthened) - Revised inspection requirements from 100 hour to 300 hour intervals. - Identification of the IceBlade assembly as an optional feature.
June 12, 2006	A	Initial issue

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	(date)
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	(date)

Annex A

See: BearPaw Assembly, drawing no. 112-0001-00.

Annex B

See: BearPaw Allowable Damage Drawing, drawing no. 314-0001-01 page 3 of 3.

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Annex A
BearPaw Assembly, Drawing no. 112-0001-00

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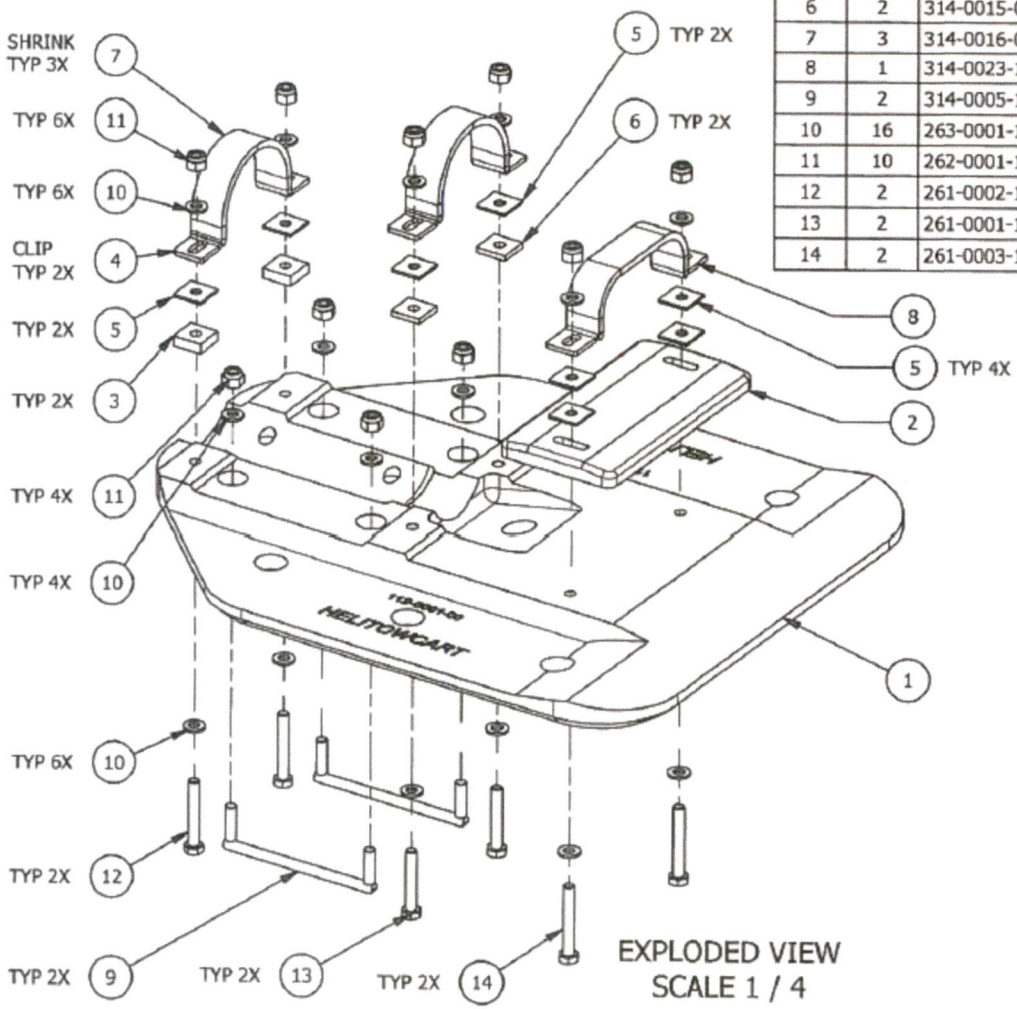
NOTES:

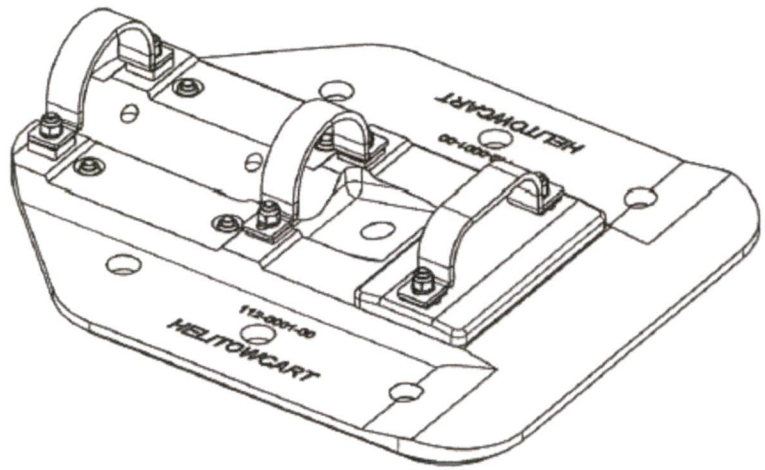
1. ICEBLADE ASSEMBLY CAN BE OMITTED FROM INSTALLATION (OPTIONAL)

2. FASTENERS LENGTH TO BE DETERMINED AT THE INSTALLATION

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
1	1	314-0001-01	BEARPAW - PAD	UHMW	---	1" THK.
2	1	314-0022-01	BEARPAW - FILLER BLOCK REAR	UHMW	---	1/2" THK.
3	2	314-0012-01	BEARPAW - FILLER BLOCK 1/4	UHMW	---	1/4" THK.
4	2	314-0006-15	BEARPAW - U SHAPED CLIP	SS304	ANNEALED	GAGE 12
5	8	314-0014-01	BEARPAW - FILLER BLOCK 1/16	UHMW	---	1/16" THK.
6	2	314-0015-01	BEARPAW - FILLER BLOCK 1/8	UHMW	---	1/8" THK.
7	3	314-0016-05	BEARPAW - SHRINK (FIT-221)	POLYOLEFIN	---	1" DIA X 5" LG.
8	1	314-0023-15	BEARPAW - LOW U SHAPED CLIP	SS304	ANNEALED	GAGE 12
9	2	314-0005-15	ICEBLADE ASSEMBLY	STEEL	---	---
10	16	263-0001-17	WASHER (AN960-416)	STEEL	---	1/4
11	10	262-0001-17	NYLON NUT (AN365-428A)	STEEL	---	1/4
12	2	261-0002-17	HEX BOLT (AN4-15A)	STEEL	QQ-P-416A	1/4-28
13	2	261-0001-17	HEX BOLT (AN4-14A)	STEEL	---	---
14	2	261-0003-17	HEX BOLT (AN4-16A)	STEEL	QQ-P-416A	1/4-28



EXPLODED VIEW
SCALE 1 / 4



ASSEMBLED
SCALE 1 / 4

REVISION				
REV	DESCRIPTION	REVISED BY	APPROVED	DATE
A	ISSUE FOR PRODUCTION	G.LAPOINTE	M. ZGELA	2006-04-25
B	MODIFY BOLT MODEL AND ADD FILLER BLOCK	G.LAPOINTE	M. ZGELA	2006-08-08
C	MODIFY BOLT MODEL AND ADD FILLER BLOCK AND SHRINK	G.LAPOINTE	M. ZGELA	2006-09-06
D	ADDITION OF STREAMLINE PAD CONFIGURATION	S.BERNIER	M. ZGELA	2009-10-22
E	ADDITION OF A REAR U SHAPED CLIP	S.BERNIER	M. ZGELA	2010-04-15
F	MODIFICATION OF LOW U SHAPED CLIP AND REAR FILLER BLOCK	R.B.R.	M. ZGELA	2013-08-09

DRAFTED BY: G. LAPOINTE — DATE: 2006/04/25
CHECKED BY: — DATE:
APPROVED TCCA BY: M. ZGELA — DATE: 2006/04/25
IF NOT SPECIFIED GENERAL TOLERANCE: 1/X ± 1/32, X.XX ± 0.010", X.XXX ± 0.005", ANG. ± 1°
UNITS: INCH
SIZE: A
SCALE: N/A

Helitowcart (Vanair inc.)
St-Nicolas, Levis, Qc, Canada
www.helitowcart.com

DEFINITION: BEARPAW ASSEMBLY

DRAWING NUMBER: 112-0001-00 — REV: F

SHEET: 1 OF 1

Annex B
BearPaw Allowable Damage Drawing, Drawing no. 314-0001-01-B, Page 3 of 3

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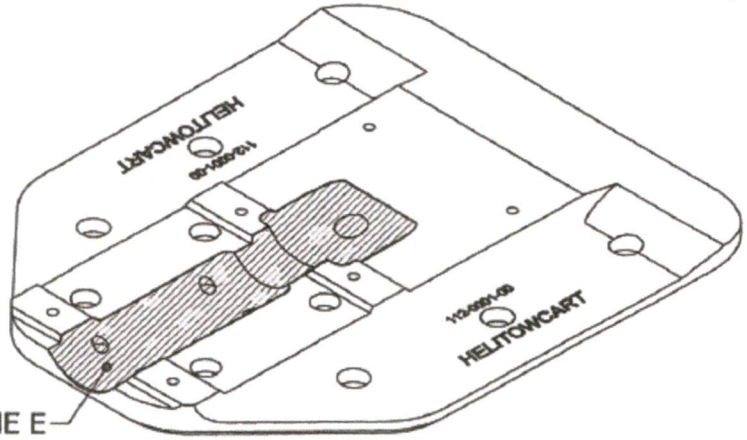

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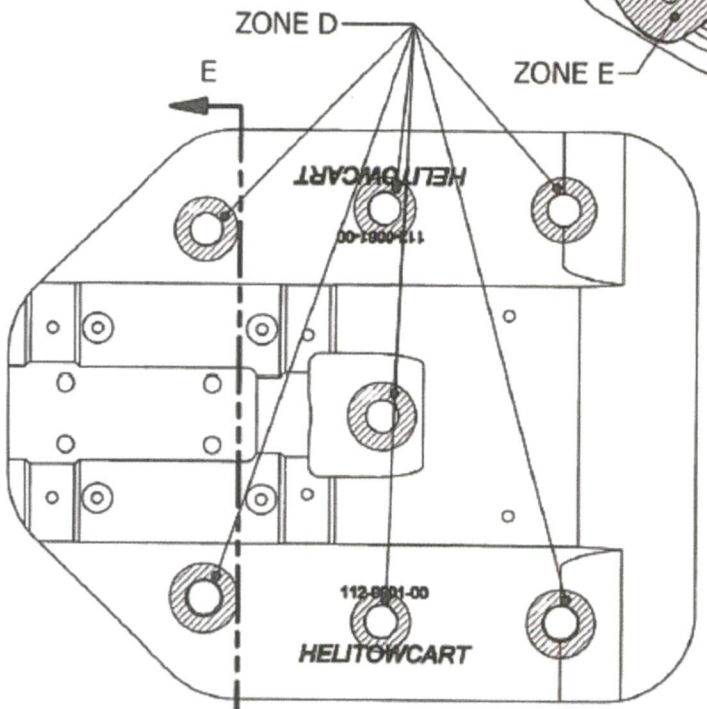

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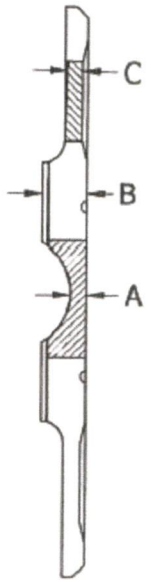

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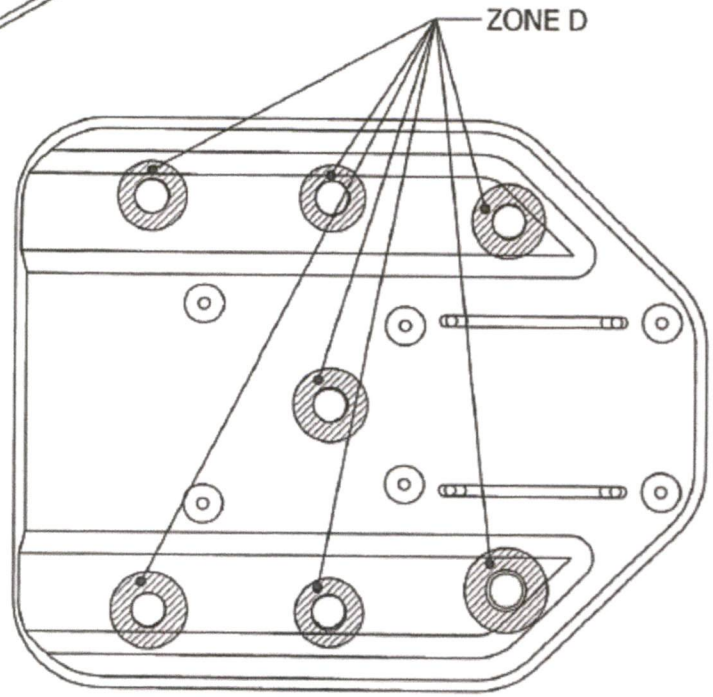

DRAFTED BY: G. LAPOINTE	DATE: 2006-04-24	**Helitowcart** (Vanair inc.) St-Nicolas, Levis, Qc, Canada www.helitowcart.com
CHECKED BY:	DATE:	DEFINITION: BEARPAW PAD
APPROVED TCCA BY: M. ZGELA	DATE: 2006-04-24	
IF NOT SPECIFIED GENERAL TOLERANCE 1/X ± 1/32 X.XX ± 0.010" X.XXX ± 0.005" ANG. ± 1°	UNITS: INCH SIZE A SCALE: N/A	DRAWING NUMBER: 314-0001-01 REV C SHEET: 3 OF 3

Master Document List

Robinson R44/R66 Helicopters
Installation of BearPaw Model BP44

Report: MDL-BP-R44-1000 (Rev F)

APPROVED BY: _____ DATE: APRIL 10, 2018

Michael Chan
TCCA Pacific Region

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www.aerodesign.ca info@aerodesign.ca

Revision	Revision Date	Revision of Entry	Entered by
F	2018-04-10	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	J. Clarke
E	2016-05-30	Changed manufacturing tolerances on BearPaw Pad	R. Berthelot
D	2013-08-28	Addition of Robinson R66 helicopter to the fleet eligibility list for BearPaw BP44 and product refinement.	R. Berthelot
C	2010 04 15	Addition of a rear U shaped clip in the streamline BearPaw Pad configuration	S. Bernier
B	2009 10 22	Introduction of new streamline BearPaw Pad configuration as alternate	S. Bernier
A	2006 09 07	Drawings are added to include the provision of shims during the installation.	N. Barbeau

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-R44-1000	Compliance Plan - Robinson R44/R66 Helicopters -Installation of Bear Paw Model BP44	A	DAR 310	Aug 28, 2013
314-0011-00	BearPaw Model BP44 – Installation Instructions - R44/R66	F	TCCA Pacific Region	Apr 10, 2018
ATS-0709-FTP-1000	R66 BearPaw Installation - Flight Test Plan/Report	NC	DAR 310	Aug 27, 2013
ATS-0709-TM-1000	Structural Substantiation – Addition of R66 Helicopter	NC	DAR 310	Aug 9, 2013
ATS-0709-EO-1000	Engineering Order – Installation of all BearPaw BP44 Configurations on R66	NC	DAR310	Aug 9, 2013
ATS-EO-BP-R44-1000	Engineering Order - BearPaw Streamline BP44	NC	DAR 310	Apr 15, 2010
HTC-TM-BP-R44-1000	Structural Substantiation - BearPaw Streamline BP44	NC	DAR 310	Oct 22, 2009
AAC-FTR-C-FBLO	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Aug 4, 2006
AAC-STR-BP-R44-1000	Structural Substantiation – Helitowcart Inc. BearPaw Model BP44	NC	DAR 310	July 4, 2006

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0001-00	BearPaw – Assembly	F	DAR 310	Aug 9, 2013
314-0001-01	BearPaw – Pad	D	DAR 310	May 30, 2016
314-0002-15	BearPaw – Iceblade	B	DAR 310	Aug 9, 2013
314-0004-15	BearPaw – Iceblade Threaded Rod	B	DAR 310	Aug 9, 2013
314-0005-15	BearPaw – Iceblade Assembly	B	DAR 310	Aug 9, 2013
314-0006-15	BearPaw – U-Shaped Clip	C	DAR 310	Aug 9, 2013
314-0012-01	Filler Block 1/4"	B	DAR 310	Aug 9, 2013
314-0014-01	Filler Block 1/16"	B	DAR 310	Aug 9, 2013
314-0015-01	Filler Block 1/8"	B	DAR 310	Aug 9, 2013
314-0022-01	Filler Block Rear	B	DAR 310	Aug 9, 2013
314-0023-15	BearPaw – Low U-Shaped Clip	B	DAR 310	Aug 9, 2013

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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0008-01	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0009-01	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0017-05	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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Master Document List

Airbus Helicopters Model AS 350/355 Series Helicopters
Installation of BearPaw Model BP350

Report: MDL-BP-AS350/355-1000 (Rev I)

APPROVED BY: _____ DATE: APRIL 10, 2018

Michael Chan
TCCA Pacific Region

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
www.aerodesign.ca info@aerodesign.ca

Revision	Revision Date	Revision of Entry	Entered by
A	Nov 22, 2006	Initial issue	N/A
B	Jan 28, 2007	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
C	Feb 28, 2007	Addition of streamline pad configuration. Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
D	July 27, 2008	Addition of vents holes in the streamline pad.	M.Z.
E	Aug 01, 2008	Modification of vents holes in the streamline pad.	M.Z.
F	April 8, 2010	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
G	December 21, 2012	Updated Tolerance data regarding Pad and Updated referenced document identification and revisions	M.Z.
H	May 30, 2016	Added recesses for skid wear shoes and leaf spring on streamline BearPaw (Dwg # 314-0018-01-S) and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.	M.Z.
I	April 10, 2018	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	B.J.C.

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
314-0020-00-E	BearPaw Model BP350 – Installation Instruction – AS350/355 Series Helicopters	H	TCCA-Pacific	April 10, 2018
AAC-STR-BP-AS350/355-1000	Structural Substantiation – Helitowcart Inc. BearPaw Model BP350	NC	DAR 310	Nov 20, 2006
AAC-FTR-C-GZNC	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Nov 21, 2006
HTS-EO-0709-002	Bear Paw Model BP350 Vent Holes	A	DAR 310	July 31, 2008
HTC-MEM-0709-001	Memorandum – Vent Hole BP350 BearPaw	A	DAR 310	July 31, 2008
HTC-TM-0709-001	Structural Substantiation – BearPaw Streamline BP350 with Recesses Wear Pads	NC	DAR 310	May 30, 2016

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0002-00	BearPaw BP350 - Assembly	B	DAR 310	Nov 20, 2006
112-0002-00-S	BearPaw BP350 – Assembly Streamline	E	DAR 310	May 30, 2016
314-0002-15 (VNR084)	BearPaw – Iceblade	A (R01)	DAR 310	Apr 24, 2006
314-0004-15 (VNR085)	BearPaw – Iceblade Threaded Rod	A (R01)	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0012-01 (VNR099)	Filler Block ¼"	A (R01)	DAR 310	Aug 8, 2006
314-0018-01 (VNR106)	BearPaw BP350 - Pad	B (R02)	DAR 310	Sept 26, 2006
314-0018-01-S (VNR106-S)	BearPaw BP350 – Pad Streamline	E	DAR 310	May 30, 2016
314-0019-15 (VNR107)	BearPaw BP350 – U Shaped Clip	A (R01)	DAR 310	Sept 29, 2006

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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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Master Document List

Airbus Helicopters Model EC 130 B4 Helicopters
Installation of BearPaw Model BP130

Report: MDL-BP-EC130-1000 (Rev B)

APPROVED BY: _____ DATE: APRIL 10, 2018

Michael Chan
TCCA Pacific Region

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
www.aerodesign.ca info@aerodesign.ca

Revision	Revision Date	Revision of Entry	Entered by
A	May 13, 2011	Initial issue	N/A
B	April 10, 2018	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	B.J.C.

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	B	TCCA Pacific Region	Apr 10, 2018

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
VNR084	BearPaw – Iceblade	R01	DAR 310	Apr 24, 2006
VNR085	BearPaw – Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0015-01	Filler Block 1/8"	A	DAR 310	Aug 8, 2006
112-0005-00	BearPaw BP130 – Assembly	A	DAR 310	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	A	DAR 310	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	A	DAR 310	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	A	DAR 310	May 04, 2011

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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Transport Canada / Transports Canada

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Transport Canada Centre – Richmond
400 – 3600 Lysander Lane
Richmond, BC, V7B 1C3
Canada

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TO

Mr. Jeff Clarke VP

Aero Design Ltd.

9888A Malaspina Road

Powell River, BC

V8A 0G3

Canada

02-0042 (0802-06)

Canada

PLEASE USE ROUTING SYMBOL ON ALL CORRESPONDENCE

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Transport Canada
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Aviation Civile

Suite 820
800 Burrard Street
Vancouver, BC V6Z 2J8

Your file *Votre référence*

Our file *Notre référence*
5010-SH06-24
RDIMS# *<see footer>*

June 7, 2018

Mr. Jeff Clarke, VP
Aero Design Ltd.
9888A Malaspina Road
Powell River, BC
V8A 0G3

Subject: Issuance of Supplemental Type Certificate (STC) SH06-24 Issue 5

Dear Mr. Clarke:

This STC is issued in response to your application. Included with the STC are the documents bearing original Transport Canada signatures.

The transfer of this STC in the name of another person requires the prior approval from the Minister in accordance with section 521.357 of the Canadian Aviation Regulations (CAR).

Embodiment of modifications requiring certification of detail part fabrication and installation, in accordance with approved data identified on the certificate, is considered to be a maintenance activity and the requirements of subsection 571.06(4) of the CARs will apply.

A Canadian Holder is required to fulfill the responsibilities of a Design Approval Document Holder in accordance with Division VIII of subpart 521 of the CAR, including the reporting of any service difficulties experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada.

For any additional information, please do not hesitate to contact the undersigned at (604) 666-8458 or by e-mail to michael.chan@tc.gc.ca.

Yours truly,

Michael Chan
Regional Engineer
Aircraft Certification
Pacific Region

Encl.

Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Number: SH06-24
Issue No.: 5
Approval Date: 17 August 2006
Issue Date: 06 June 2018

Responsible Office: Pacific
Aircraft/Engine Type or Model: See Continuation Sheet
Canadian Type Certificate or Equivalent: See Continuation Sheet
Description of Type Design Change: Installation of BearPaw

Installation/Operating Data, Required Equipment and Limitations:

For Robinson Models R44, R44 II and R66:

Installation is to be performed in accordance with Aero Design Ltd. Master Document List MDL-BP-R44-1000, Revision F, dated 10 April 2018, or later TCCA approved revision.

The BearPaw must be installed in accordance with Aero Design Ltd. document 314-0011-00 "BearPaw Model BP44, Installation Instructions - R44/R66" as specified by Master Document List MDL-BP-R44-1000.

For Airbus Models AS350 and AS355 Series:

Installation is to be performed in accordance with Aero Design Ltd. Master Document List MDL-BP-AS350/355-1000, Revision I, dated 10 April 2018, or later TCCA approved revision.

The BearPaw must be installed in accordance with Aero Design Ltd. document 314-0020-00-E "BearPaw Model BP350, Installation Instructions – AS350/355" as specified by Master Document List MDL-BP-AS350/355-1000.

- See Continuation Sheets -

MINISTRY OF TRANSPORT CANADA

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

Michael Chan
For Minister of Transport

Canada

For the Airbus EC130 Series:

Installation is to be performed in accordance with Aero Design Ltd. Master Document List MDL-BP-EC130-1000, Revision B, dated 10 April 2018, or later TCCA approved revision.

The BearPaw must be installed in accordance with Aero Design Ltd. document 314-0031-00 "BearPaw Model BP130, Installation Instructions - EC130" as specified by Aero Design Ltd. Master Document List MDL-BP-EC130-1000.

Limitations:

N/A

Required equipment:

N/A

- See Continuation Sheet -

Fleet Eligibility List		
Make	**Model**	**Type Certificate Data Sheet**
Robinson	R44	H-97
Robinson	R44 II	H-97
Robinson	R66	H-111
Airbus	AS 350 D	H-83
Airbus	AS 350 B	H-83
Airbus	AS 350 B1	H-83
Airbus	AS 350 B2	H-83
Airbus	AS 350 B3	H-83
Airbus	AS 350 BA	H-83
Airbus	EC 130 B4	H-83
Airbus	AS 355 E	H-87
Airbus	AS 355 F	H-87
Airbus	AS 355 F1	H-87
Airbus	AS 355 F2	H-87
Airbus	AS 355 N	H-87

– End –

Master Document List

Robinson R44/R66 Helicopters
Installation of BearPaw Model BP44

Report: MDL-BP-R44-1000 (Rev F)

APPROVED BY: _____ DATE: June 6, 2018

Michael Chan
TCCA Pacific Region

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
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Revision	Revision Date	Revision of Entry	Entered by
F	2018-04-10	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	J. Clarke
E	2016-05-30	Changed manufacturing tolerances on BearPaw Pad	R. Berthelot
D	2013-08-28	Addition of Robinson R66 helicopter to the fleet eligibility list for BearPaw BP44 and product refinement.	R. Berthelot
C	2010 04 15	Addition of a rear U shaped clip in the streamline BearPaw Pad configuration	S. Bernier
B	2009 10 22	Introduction of new streamline BearPaw Pad configuration as alternate	S. Bernier
A	2006 09 07	Drawings are added to include the provision of shims during the installation.	N. Barbeau

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-R44-1000	Compliance Plan - Robinson R44/R66 Helicopters -Installation of Bear Paw Model BP44	A	DAR 310	Aug 28, 2013
314-0011-00	BearPaw Model BP44 – Installation Instructions - R44/R66	F	TCCA Pacific Region	Apr 10, 2018
ATS-0709-FTP-1000	R66 BearPaw Installation - Flight Test Plan/Report	NC	DAR 310	Aug 27, 2013
ATS-0709-TM-1000	Structural Substantiation – Addition of R66 Helicopter	NC	DAR 310	Aug 9, 2013
ATS-0709-EO-1000	Engineering Order – Installation of all BearPaw BP44 Configurations on R66	NC	DAR310	Aug 9, 2013
ATS-EO-BP-R44-1000	Engineering Order - BearPaw Streamline BP44	NC	DAR 310	Apr 15, 2010
HTC-TM-BP-R44-1000	Structural Substantiation - BearPaw Streamline BP44	NC	DAR 310	Oct 22, 2009
AAC-FTR-C-FBLO	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Aug 4, 2006
AAC-STR-BP-R44-1000	Structural Substantiation – Helitowcart Inc. BearPaw Model BP44	NC	DAR 310	July 4, 2006

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0001-00	BearPaw – Assembly	F	DAR 310	Aug 9, 2013
314-0001-01	BearPaw – Pad	D	DAR 310	May 30, 2016
314-0002-15	BearPaw – Iceblade	B	DAR 310	Aug 9, 2013
314-0004-15	BearPaw – Iceblade Threaded Rod	B	DAR 310	Aug 9, 2013
314-0005-15	BearPaw – Iceblade Assembly	B	DAR 310	Aug 9, 2013
314-0006-15	BearPaw – U-Shaped Clip	C	DAR 310	Aug 9, 2013
314-0012-01	Filler Block 1/4"	B	DAR 310	Aug 9, 2013
314-0014-01	Filler Block 1/16"	B	DAR 310	Aug 9, 2013
314-0015-01	Filler Block 1/8"	B	DAR 310	Aug 9, 2013
314-0022-01	Filler Block Rear	B	DAR 310	Aug 9, 2013
314-0023-15	BearPaw – Low U-Shaped Clip	B	DAR 310	Aug 9, 2013

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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0008-01	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0009-01	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0017-05	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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Master Document List

Airbus Helicopters Model AS 350/355 Series Helicopters
Installation of BearPaw Model BP350

Report: MDL-BP-AS350/355-1000 (Rev I)

APPROVED BY: _____ DATE: June 6, 2018

Michael Chan
TCCA Pacific Region

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
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Revision	Revision Date	Revision of Entry	Entered by
A	Nov 22, 2006	Initial issue	N/A
B	Jan 28, 2007	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
C	Feb 28, 2007	Addition of streamline pad configuration. Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
D	July 27, 2008	Addition of vents holes in the streamline pad.	M.Z.
E	Aug 01, 2008	Modification of vents holes in the streamline pad.	M.Z.
F	April 8, 2010	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
G	December 21, 2012	Updated Tolerance data regarding Pad and Updated referenced document identification and revisions	M.Z.
H	May 30, 2016	Added recesses for skid wear shoes and leaf spring on streamline BearPaw (Dwg # 314-0018-01-S) and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.	M.Z.
I	April 10, 2018	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	B.J.C.

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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
314-0020-00-E	BearPaw Model BP350 – Installation Instruction – AS350/355 Series Helicopters	H	TCCA-Pacific	April 10, 2018
AAC-STR-BP-AS350/355-1000	Structural Substantiation – Helitowcart Inc. BearPaw Model BP350	NC	DAR 310	Nov 20, 2006
AAC-FTR-C-GZNC	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Nov 21, 2006
HTS-EO-0709-002	Bear Paw Model BP350 Vent Holes	A	DAR 310	July 31, 2008
HTC-MEM-0709-001	Memorandum – Vent Hole BP350 BearPaw	A	DAR 310	July 31, 2008
HTC-TM-0709-001	Structural Substantiation – BearPaw Streamline BP350 with Recesses Wear Pads	NC	DAR 310	May 30, 2016

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0002-00	BearPaw BP350 - Assembly	B	DAR 310	Nov 20, 2006
112-0002-00-S	BearPaw BP350 – Assembly Streamline	E	DAR 310	May 30, 2016
314-0002-15 (VNR084)	BearPaw – Iceblade	A (R01)	DAR 310	Apr 24, 2006
314-0004-15 (VNR085)	BearPaw – Iceblade Threaded Rod	A (R01)	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0012-01 (VNR099)	Filler Block ¼"	A (R01)	DAR 310	Aug 8, 2006
314-0018-01 (VNR106)	BearPaw BP350 - Pad	B (R02)	DAR 310	Sept 26, 2006
314-0018-01-S (VNR106-S)	BearPaw BP350 – Pad Streamline	E	DAR 310	May 30, 2016
314-0019-15 (VNR107)	BearPaw BP350 – U Shaped Clip	A (R01)	DAR 310	Sept 29, 2006

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3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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Master Document List

Airbus Helicopters Model EC 130 B4 Helicopters
Installation of BearPaw Model BP130

Report: MDL-BP-EC130-1000 (Rev B)

APPROVED BY: _____ DATE: June 6, 2018

Michael Chan
TCCA Pacific Region

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
www.aerodesign.ca info@aerodesign.ca

Revision	Revision Date	Revision of Entry	Entered by
A	May 13, 2011	Initial issue	N/A
B	April 10, 2018	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.	B.J.C.

Tel: 1-604-483-2376, 9888A Malaspina Road, Powell River, BC, Canada, V8A 0G3
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1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	B	TCCA Pacific Region	Apr 10, 2018

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
VNR084	BearPaw – Iceblade	R01	DAR 310	Apr 24, 2006
VNR085	BearPaw – Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0015-01	Filler Block 1/8"	A	DAR 310	Aug 8, 2006
112-0005-00	BearPaw BP130 – Assembly	A	DAR 310	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	A	DAR 310	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	A	DAR 310	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	A	DAR 310	May 04, 2011

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www.aerodesign.ca info@aerodesign.ca

3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	A	N/A	Sept 6, 2006

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REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
April 04, 2018	F	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.
August 09, 2013	E	Addition of Robinson R66 helicopter, removal of pocket version of the BearPaw and removal of revision letters from part numbers.
April 15, 2010	D	Addition of a rear U shaped clip in the Streamline BearPaw Pad configuration.
October 22, 2009	C	Introduction of new streamline BearPaw Pad configuration as alternate.
September 7, 2006	B	- Added filler blocks and heat shrink to product list. - Modified recommended bolt models (lengthened) - Revised inspection requirements from 100 hour to 300 hour intervals. - Identification of the IceBlade assembly as an optional feature.
June 12, 2006	A	Initial issue

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	06 June 2018

Annex A

See: BearPaw Assembly, drawing no. 112-0001-00.

Annex B

See: BearPaw Allowable Damage Drawing, drawing no. 314-0001-01 page 3 of 3.

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REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
Nov 20,2006	A	Initial issue
Jan 29, 2007	B	Minor editorials. Change to weight & Balance Data to reflect production model. Change in inspection schedule from 300 to 500 hours to match existing landing gear periodicity.
Feb 28, 2008	C	Introduction of new streamline BearPaw Pad configuration as alternate.
Aug 01, 2008	D	Modification of vent holes on the streamline pad
April 8, 2010	E	Correction to C of G data
December 21, 2012	F	Updated Pad Tolerances and Document identifications . Improved page set up for reader convenience.
April 29, 2016	G	Added recesses for skid wear shoes and leaf spring on streamline BearPaw and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.
10 April, 2018	H	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan – TCCA Pacific Region	06 June 2018

Annex A – BearPaw Assembly Drawing

See: BearPaw Assembly, dwg no. (112-0002-00) for Pocket style pad or;
BearPaw Assembly, dwg no. (112-0002-00-S) for Streamline pad

Annex B – Tolerance Zones for Cracks and Wear

See: BearPaw Pad, dwg no. 314-0018-01 (VNR106) for Pocket style pad;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev A to D for Streamline pad without recess;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev E for Streamline pad with recesses.

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E	0,05 (FWD) 0.625 (AFT)	0,050 0,075	Holes: NO cracks around the holes.

Overhaul Requirements

- Not applicable for the designated application of this device.

REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
May 04,2011	A	Initial issue
April 10, 2018	B	Change of holder from Helitowcart to Aero Design Ltd. Remove references to Helitowcart.

Approval

Internal Approval :		
Aero Design Ltd.	Jeff Clarke, Vice President	06 June 2018
External Approval :		
Transport Canada	Michael Chan, TCCA Pacific Region	06 June 2018

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Aero Design Ltd.

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DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Helicopter Bear Paws Installation, as detailed in the data approved by Transport Canada on approval SH06-24, Issue 5, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file Q-18-0046 as shown.

Aero Design Ltd.

per: _____
Signature

Jeff Clarke	Vice President	31 May 2018
Print Name	Title	Date

Aero Design Ltd.

9888A Malaspina Road
Powell River, BC, V8A 0G3
Phone: 604-483-2376
Fax: 604-483-2372
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SIGNED UNDERTAKING

In accordance with CAR 521, Aero Design Ltd. hereby undertake to carry out the responsibilities of a design approval document holder, as set out in Division VIII of Part V, Subpart 21 of the CARs, regarding:

1. Technical capability,
2. Service difficulty reporting,
3. Establishing a service difficult reporting system,
4. Investigation of service difficulty reports,
5. Mandatory changes,
6. Transfers,
7. Record keeping and loss or disposal of records,
8. Manuals,
9. Instructions for continued airworthiness, and
10. Supplemental integrity instructions

X _____ 12 August 2016

Signature of Holder's authorized person: *Date:*

Vice President

Position / Title:

Note: This signed undertaking applies to all design approval documents for which Aero Design Ltd. is the document holder. A copy of this signed undertaking will be provided for any approval issued subsequent to the date of this signed undertaking where Aero Design Ltd. is the holder of the design approval document.

Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Helitowcart (Vanair Inc.)
877A, Alphonse-Desrochers
St-Nicholas, Lévis, Québec
Canada G7A 5K6

Number: SH06-24
Issue No.: 4
Approval Date: August 17, 2006
Issue Date: October 10, 2013

Responsible Office: Québec

Aircraft/Engine Type or Model: See Continuation Sheet on Page 2 of 2

Canadian Type Certificate or Equivalent: See Continuation Sheet on Page 2 of 2

Description of Type Design Change: Installation of Helitowcart BearPaw

Installation/Operating Data, Required Equipment and Limitations:

For the Robinson Models R44, R44 II and R66 Helicopters:

Installation of Helitowcart Bear Paw BP44 is to be performed in accordance with TC approved Helitowcart Master Document List Report: HTC-MDL-BP-R44-1000, Revision D dated August 28, 2013, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Document: 314-0011-00, BearPaw Model BP44, Installation Instructions – R44/R66, Revision E dated August 09, 2013 or later Transport Canada approved revision.

See Continuation Sheet Page 2 of 2

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

Jean-Pierre Francoeur
For Minister of Transport

Canada

Installation/Operating Data,
Required Equipment and Limitations (Cont'd):

For the Eurocopter (formerly Aerospatiale) AS350 and AS355 Series Helicopters:

Installation of Helitowcart Bear Paw BP350 is to be performed in accordance with TC approved Helitowcart Master Document List Report: HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Document: 314-0020-00-E, BearPaw Model BP350, Installation Instructions – AS350/355, Revision F dated December 21, 2012 or later Transport Canada approved revision.

For the Eurocopter EC 130 Helicopters:

Installation of Helitowcart Bear Paw BP130 is to be performed in accordance with TC approved Helitowcart Master Document List Report: HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Document: 314-0031-00-A, BearPaw Model BP130, Installation Instructions – EC130, Revision A dated May 04, 2011 or later Transport Canada approved revision.

Fleet Eligibility List		
Make	**Model**	**Type Certificate Data Sheet**
Robinson	R44	H-97
Robinson	R44 II	H-97
Robinson	R66	H-111
Eurocopter	AS 350 B	H-83
Eurocopter	AS 350 B1	H-83
Eurocopter	AS 350 B2	H-83
Eurocopter	AS 350 B3	H-83
Eurocopter	AS 350 BA	H-83
Eurocopter	AS 350 D	H-83
Eurocopter	EC 130 B4	H-83
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	H-87
Eurocopter	AS 355 F1	H-87
Eurocopter	AS 355 F2	H-87
Eurocopter	AS 355 N	H-87

– End –

TRANSFER PLAN

SH06-24

Plan for the transfer of TCCA Design Approval Document SH06-24

BearPaws Installation on Airbus Helicopters AS350/AS355/EC130B4

And Robinson R44/R66

From:
Helitowcart (Vanair Inc.)
877 A, Alphonse-Desrochers
Saint-Nicholas (Levis) QC, Canada
G7A 5K6

To:
Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Prepared by: Jeff Clarke, P.Tech.(Eng.) – Aero Design Ltd.

Revision 0, 02 April 2018

Aero Design Ltd.

9888A Malaspina Road, Powell River, BC, V8A 0G3
Phone: 604-483-2376
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www.aerodesign.ca

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1.0 TRANSFER SUMMARY

The subject of this Design Approval Document transfer is TCCA STC SH06-24 for the installation of bear paws on Airbus Helicopters AS350/AS355 and EC130 helicopters, and Robinson R44 and R66 helicopters.

Bear paws are used to provide greater surface area to the landing gear in order to prevent the landing gear from sinking in to soft ground such as mud or snow to maintain adequate ground clearance from the tail rotor. These bear paws also incorporate an "ice blade", carbide rods bolted through the pad, to aid traction on ice during start up.

Aero Design Ltd. is in the market of producing helicopter cargo baskets, bike racks, cabin steps and similar aeronautical products. Bear paws are a complimentary product to those already on offer, and many operators are looking to equip their aircraft from one supplier where possible. Aero Design Ltd. has expanded their product line to regions where the Helitowcart products have not, such as Europe, Brazil, and China. Helitowcart does not have the capability in-house to pursue foreign approvals, and using an external contractor can make the cost of doing so prohibitive when compared to the price and margins on the product. Aero Design Ltd. does have this capability and is willing to expand the Bear Paw line to new regions. As such, Aero Design Ltd. and Helitowcart have entered into a purchase agreement for the Bear Paw line.

This document is used to demonstrate the transfer requirements as indicated in TCCA Staff Instruction SI 500-018, specifically section 5 and the form provided in Appendix A.

2.0 TRANSFER REQUIREMENTS

The following sections follow section 5 of SI 500-18.

2.1 Continuing Airworthiness Responsibilities

The following sections address the need for TCCA to be satisfied the data has been transferred to Aero Design Ltd., and that Aero Design Ltd. is competent to use the data as necessary to maintain Continued Airworthiness of the aircraft.

As this transfer takes place within one state of type design, there are no requirements to communicate with a foreign authority.

2.2 Communication

Helitowcart and their DAR, Mirko Zgela, are located in the Quebec region of Transport Canada. The Regional Engineer has not been identified.

Aero Design Ltd. is located in the Pacific Region of Transport Canada. The Regional Engineer assigned to Aero Design Ltd. is Michael Chan. The Primary Maintenance Inspector for the Aero Design Ltd. Approved Manufacturing Facility is Bruce Tout.

Following review of the transfer, it is recommended the project file be transferred to Pacific Region to facilitate the holder transfer and on-going maintenance of the approval by Aero Design Ltd. moving forward.

2.3 Languages

All documents are prepared in English.

2.4 Obligations of Holders and Applicants

Current holder:
Helitowcart (Vanair Inc.)
877 A, Alphonse-Desrochers,
Saint-Nicholas (Levis), QC, Canada
G7A 5K6

Notice of intention to transfer and application for transfer will be initiated by Helitowcart through their DAR, Mirko Zgela, in the Quebec region.

New holder information, as noted on the design change approval application form:
Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Point of contact:
Jeff Clarke – Vice-President, Engineering Technologist – 604-483-2376

The approved publication numbering and nomenclature or anything else affecting the content of the data sheet will not be changed at this time.

2.5 Involvement of Other Authorities

Not applicable – transfer from Canadian holder to Canadian applicant.

2.6 Transfer Plan

2.6.1 Design Data

A digital copy of the design data is to be transferred to Aero Design Ltd.

2.6.2 Production

All of the available stock of completed Bear Paw kits and components is to be shipped to Aero Design Ltd. The parts will include the appropriate Authorized Release Certificates (Form One). These parts may be released directly to customers without further evaluation or release by the Aero Design Ltd. Approved Manufacturing Facility.

Aero Design Ltd. is the holder of Approved Organization Certificate 73-04 for the production of aeronautical products. Fabrication methods and materials of the Bear Paws and components

are similar to the products already in production by Aero Design Ltd. The STC will be added to the Aero Design Ltd. Approved Manufacturing Facility Approval Limitation Record after re-issue of the STC. TCCA Maintenance and Manufacturing has been advised of the pending transfer and will be kept informed of the progress to ensure the Approval Limitation Record is updated as soon as possible.

Helitowcart will provide to Aero Design Ltd. the contact information for the vendors that supply the components of the Bear Paws to ensure uninterrupted supply. Any vendors selected by Aero Design Ltd. to continue production of components will be evaluated in accordance with their Approved Manufacturing Facility Manual.

New production by Aero Design Ltd. will commence as stock levels dictate.

2.6.3 Continued Airworthiness

Aero Design Ltd. will assume responsibility for the Continued Airworthiness of the Bear Paw kits currently in use. The ICA are updated with new contact information and shall be provided to the list of purchasers supplied by Helitowcart.

2.7 Review of Applicant's Capability to Hold a Design approval document

Aero Design Ltd. is currently the holder of a number of STCs, mostly for helicopter cargo baskets, bike racks, and cabin steps. This approval is similar in terms of complexity, fabrication methods and materials to approvals already held.

2.7.1 Current employees

The following people are employed by Aero Design Ltd. in the capacity of engineer or engineering technologist and have attained the technical capability to provide on-going support of design approval documents held by Aero Design Ltd.:

1. Jeff Clarke, P.Tech.(Eng.)

   - Professional Technologist (Engineering) - ASET

   - Diploma in Aeronautical Engineering Technology (2001), Southern Alberta Institute of Technology

   Background: Jeff has worked for Aero Design Ltd. in the capacity of Engineering Technologist since May 2001. He has been responsible for conducting the analyses and tests to develop the data used to show compliance with the certification basis specified for projects while working under Transport Canada delegate E. Burgoin (DAR 290M) until 2013 when Mr. Burgoin retired. He has continued these responsibilities while using an outside contracted DAR.

2.7.2 Delegates and professional engineers

The following people are Transport Canada DARs or professional engineers with a working relationship with Transport Canada. Aero Design Ltd. has confirmed they have access to the following people/organizations:

1. J. Tinson, P.Eng., DAR 304 – general, powerplant and structures
2. DECA Aviation Engineering Ltd.

2.8 Type Design Examination

Not required – transfer from Canadian holder to Canadian applicant, and recent approval does not require evaluation for aging aircraft considerations (original issue date 17/08/2006, current issue 10/10/2013).

2.9 Certification Basis

Not applicable – transfer from Canadian holder to Canadian applicant.

2.10 Substantiating Data and Reports

Digital copies of the substantiating data is to be provided by Helitowcart (see 2.6), and an authorization letter for release of the data from the original DAR, Mirko Zgela, to Aero Design Ltd. has been provided.

2.11 Type Certificate Data Sheets (TCDS) and Continuation Sheets

In order to ensure a clear history of ownership of the STC, the following statement shall be added to the STC document:

> Effective (issue date), the holder Helitowcart (Vanair Inc.) was changed to Aero Design Ltd. Production under Aero Design Ltd. commenced (issue date). The products are not serialized; the manufacturer is noted on the Authorized Release Certificate.

2.12 NAPA Entries

To be completed by the TCCA Regional Engineer.

2.13 Manuals

The following documents will be updated to reflect the transfer to the new holder:

Aircraft Flight Manual Supplement – none.

Instructions for Continued Airworthiness:

> Airbus Helicopters AS350/AS355 – 314-0020-00 to Revision G
>
> Airbus Helicopters EC130 - 314-0031-00 to Revision B
>
> Robinson R44/R66 – 314-0011-00 to Revision F

MMEL – none.

Copies of the updated manuals will be provided at no cost to TCCA. Copies shall be distributed to all purchasers of the Bear Paws identified by HeliTowCart, to the email and/or physical address provided by HeliTowCart.

2.14 Supplemental Integrity Instructions

Not applicable – this installation is not the subject of or has an effect on a supplemental integrity instruction.

2.15 Fees and Cost Recovery

Fees are to be charged to Aero Design Ltd.

2.16 Informing ICAO Contracting States of Design Approval Document Transfers

To be completed by TCCA regional office.

2.17 Coordinating the (re)-issue of the Canadian and Foreign Design approval documents

Not applicable – not a foreign design approval.

APPENDIX A

SI 500-018 – APPENDIX A FORM

APPENDIX A— TRANSFER A DESIGN APPROVAL DOCUMENT FROM A HOLDER IN CANADA TO AN APPLICANT IN CANADA

To transfer a design approval document from a holder in Canada to an applicant in Canada:	YES	NO	N/A
• Has the holder notified TCCA in writing, of his intent to transfer the design approval document?			
• Is all relevant documentation in English or French?			
• Have the requirements of subsection 521.357(1) of the CARS been met?			
• Does the application include o the legal and trade names and address of the applicant? o points of contact within the applicant's organization? o changes to approved publication numbering and nomenclature, or any other changes affecting the content of the TCDS? o the Service Bulletin announcing the change in holder?			
• Has a Transfer Plan been drafted?			
• Does the data package include: o detailed design description and associated drawings? o certification basis? o certification plans and associated reports? o all manuals required for ICAs? o Structural and Component Repair Manuals? o Details of service difficulties and their resolutions? o Details of ADs and mandatory SBs? o Installation instructions? o AFM and AFMS? o MMEL? o Production process or inspection documents? o List of initial sales or distributions?			
• Has the TCDS or Continuation Sheet been updated? • Has NAPA been updated?			
• Have all manuals been updated? o AFM or AFMS o ICA documents o MMEL o Does TCCA have sufficient manuals?			
• Have the SII requirements of section 521.369 of the CARs been met?			
• Have the appropriate fees been paid?			
• Have the Aircraft Certification Regulatory Standards Division and the Continuing Airworthiness Division been notified?			
• Has the new design approval document been issued?			

Completed by (name) **Date**

HELI TOW CART BY VANAIR

April 9th 2018

Object: STC Transfer Authorization

To Transport Canada

This letter is to inform you that we have sold the both of our STC'd products lines, Bearpaws and EPR to Aero Design Ltd. Located in Power River, BC.

We therefore authorize Mirko Zgela to initiate the transfer of the Bearpaw STC with Transport Canada on behalf of Helitowcart.

We will handle the EPR transfer as members of the Aero Design team had already worked on this project.

Should you need further information, please do not hesitate to contact Helitowcart or Aero Design.

Transferee

Aero Design Ltd.
9888 A Malaspina Rd.
Powell River, BC, Canada
V8A 0G3

jason@aerodesign.ca
jeff@aerodesign.ca
604-483-2376

Current Holder

Helitowcart (Vanair Inc.)
877A Alphonse-Desrochers
Levis, QC, Canada
G7A 5K6

mpcaissy@helitowcart.com
info@helitowcart.com
418-561-4512

Kindest Regards,
Jacob Chénard
CEO & Accountable Executive

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Tel: 604.483.2376
Fax: 604.483.2372
www.aerodesign.ca

09 April 2018

Transport Canada
Aircraft Certification Division
Suite 620
800 Burrard Street
Vancouver, BC
V6Z 2J8

Attention: Mr. Michael Chan

Re: Transfer of TCCA STCs SH06-24 and SH11-46

Please accept this letter as written evidence of intent to transfer the holder of TCCA STC SH06-24 for helicopter bear paws and SH11-46 for an external power receptacle from Helitowcart (Vanair Inc.) to Aero Design Ltd. Aero Design Ltd. has entered into a purchase agreement for these approvals from Helitowcart.

Design Change Approval Application forms for these transfer are included with this letter. Transfer plans are being drafted and will be sumitted when complete.

A copy of this letter is supplied to Helitowcart to include with the submission to their regional engineer.

Please contact me if you have any questions.

Regards,

Jeff Clarke, P.Tech.(Eng.)
Vice President

Encl.